PLACENTA PRÆVIA*

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PLACENTA prævia has long been recognised as one of the most dangerous complications of pregnancy. Just over a hundred years ago, the maternal mortality from this cause was 30% and the fœtal mortality 60%. By 1939, the maternal mortality had dropped to 5%, but the fœtal loss was little changed at 54%. In 1945–50 the modern views on the treatment were widely described, and in the middle '50s the maternal mortality again fell appreciably. In some centres the perinatal fœtal mortality has now been reduced to around 10%.

One reason for this improvement is that the attitude of both doctors and midwives towards antepartum hæmorrhage has altered. They no longer look upon it as a surgical emergency which must be dealt with immediately in the patient's own home. Hence in the vast majority of cases the patient is transferred to hospital without any attempt to confirm the diagnosis of placenta prævia by vaginal examination. This fact is evident from the Oxford and Belfast series in table I, which are shown in contrast to an Indian series (Qureshi 1953) where 80% of the deaths were in women who had been examined before admission.

TABLE I—THREE SERIES COMPARED

Series	No. of cases	Maternal mortality	Perinatal mortality	Cæsarean section	No. of examinations
R.M.H. 1946–53 ..	200	..	11·9%	76%	2
Oxford 1948–59 ..	217	..	9·7%	66%	..
Qureshi 1934–45 ..	200	30 (*15%*)	67%	16%	24

R.M.H. = Royal Maternity Hospital, Belfast.

Nevertheless, avoidable deaths are still occurring. The report on confidential inquiries into maternal deaths in England and Wales 1952–54 shows that even within recent years the profession in England and Wales has not fully appreciated the essentials of treatment. During those three years 29 women died as the result of placenta prævia, and avoidable factors were considered to be present in 55% of these:

> "There were often several avoidable factors in one case, a common combination being failure to anticipate trouble, in that anæmia was left untreated, warning hæmorrhage ignored or women of high parity booked for home confinement; then when hæmorrhage occurred, sometimes in a patient already unlikely to withstand it, the action was hesitant or plainly ill considered."

Today there should be no hesitation about transferring any case of antepartum hæmorrhage to hospital. There are few exceptions to this rule, and I shall deal with them later.

It should surely be obvious that a premature vaginal examination may precipitate a hæmorrhage. Such a hæmorrhage may necessitate immediate treatment, irrespective of the duration of the pregnancy. This means an additional risk to both mother and baby.

The next improvement has been the more general adoption of expectant treatment. We have long since got over Jaggard's dictum that "there is no expectant plan of treatment for placenta prævia".

Duration of Pregnancy

When a patient is admitted with antepartum hæmorrhage, the duration of pregnancy must be taken into account.

1. If the pregnancy has reached 37–40 weeks, delay in treatment is unwarranted. Having typed the patient's blood and determined the hæmoglobin level, one should not fail to make a diagnosis of the cause of the hæmorrhage. Examination of the abdomen will go a long way towards confirming or disproving the diagnosis of placenta prævia. If the presenting part is high, the fœtal heart (even after a moderate hæmorrhage) is undisturbed, and the uterus is not tender, the patient probably has a major degree of placenta prævia. If the presenting part is easily felt above the symphysis pubis and tends to overlap it, the placenta is posterior; while if the head is not easily felt unless the examining fingers approach it from either side, the placenta is in front.

The final answer can be given by a vaginal examination, but this should be done only with the patient on the operating-table. Such examinations have been criticised, but unless the position of the placenta is accurately determined many unnecessary cæsarean sections will be performed.

If the first episode of bleeding has been at 30–34 weeks, expectant treatment plays an important part. The object should be to avoid any active treatment until the patient has reached 37–38 weeks, but whether this can be achieved depends on her behaviour from day to day. The attendant's hands may be forced by the recurrence or persistence of bleeding of such degree that delay in treatment would jeopardise life. Though spontaneous catastrophic hæmorrhage is extremely rare—so rare that Dr. Herman Johnson in the U.S.A. felt confident enough to challenge anyone to produce a case—persistent or repeated small hæmorrhages may result in serious maternal anæmia.

During expectant treatment, measures should be taken to improve the patient's general condition, and blood-transfusion may often be required to correct anæmia quickly.

Evidence of the value of expectant treatment is given in table II, which analyses series of cases collected from hospital reports.

To show that the 75 cases in Belfast were not loaded favourably with mature babies I should point out that 25 of the 75 patients had their first hæmorrhage before the 30th week. In these 25 the shortest time between admission and treatment was twelve days and all were delivered of live babies. Unfortunately, 3 of these died in the neonatal period, but even in this unfavourable group the fœtal mortality was only 12%.

TABLE II—MORTALITY IN RELATION TO EXPECTANT TREATMENT

Series	No. receiving expectant treatment	Fœtal mortality	Maternal mortality
1553	257 (*16·5%*)	14·7%	0·79%
1353	187 (*13·8%*)	20·8%	1·07%
200 (R.M.H.)	75 (*35%*)	8·5%	..

* From a lecture given at Queen Charlotte's Hospital, London, on Sept. 25, 1959.

X-ray Diagnosis

It is in cases of antepartum hæmorrhage at 30–37 weeks that X-ray diagnosis may be of assistance. At this stage accurate clinical diagnosis can be difficult unless the fœtal head is deeply engaged, although a thin placenta prævia may not prevent engagement. With modern radiological techniques the placenta can be located in a fairly high proportion of cases, but one must remember that with placenta diffusa or membranacea, or a placenta on one side of the lower uterine segment, the X-ray appearances can be frankly misleading. If in doubt, the case must be treated as one of placenta prævia until 37 or 38 weeks.

In the discussion on placentography at the Royal Society of Medicine in January, 1959, very diverse views were expressed. Some teachers would use placentography in all cases of antepartum hæmorrhage, or a high free head, whereas others regard it as quite unnecessary or even " dangerous nonsense ". Personally I am relieved to find that even some of its earlier advocates have now discarded this type of examination. In my hospital placentography has not been done for some years, and X-ray pelvimetry is almost a thing of the past. In the course of the discussion Dr. Blair Hartley said:

> " I do not accept that adequate placentography can be carried out using only a single lateral view with the patient lying down (as has been claimed). Even with four films, carefully planned, really adequate opinion is, not infrequently, very difficult to offer, even in expert hands." (Hartley 1959.)

Coming from a radiologist, and an advocate of placentography, I would regard this as complete condemnation of this method of examination. As an obstetrician Mr. John Stallworthy said:

> " The idealistic goal which had been set in the treatment of placenta prævia over ten years ago, namely, that there should be no maternal deaths and an uncorrected fœtal wastage of 10 per cent or less, had been achieved, but in doing so it had been found that the radiological diagnosis was seldom necessary."

Four possible causes of the bleeding have to be considered:

1. Placenta prævia.
2. Separation of a normally situated placenta.
3. Hæmorrhage from a circumvallate placenta.
4. Toxic accidental hæmorrhage in a patient with a placenta prævia.

The other local causes of antepartum hæmorrhage—e.g., cervical polyp and carcinoma of cervix—should be excluded by passing a vaginal speculum and inspecting the cervix.

Percival and Murray (1955) maintained that soft-tissue placentography could reduce the use of valuable antenatal beds for cases of antepartum hæmorrhage. They wrote: " In non-toxic accidental haemorrhage, once placenta prævia has been excluded and bleeding has ceased, the patient can be safely sent home ". I am afraid I cannot agree with this; for even non-toxic accidental hæmorrhage seems to carry a fœtal mortality higher than that of placenta prævia treated by modern methods. If I am right, the differentiation between non-toxic accidental hæmorrhage and hæmorrhage from placenta prævia is of little practical value at this period of gestation, since the patient should in any case be retained in hospital for investigation and observation.

The circumvallate placenta is often associated with small recurrent antepartum hæmorrhages, but several other features help in the diagnosis. The uterus seems smaller than the period of amenorrhœa would suggest; the baby is small; and the presenting part is usually well engaged. In addition, placentography may demonstrate the placenta in the upper uterine segment, and there is no evidence of toxæmia.

Association of a placenta prævia with a toxic accidental hæmorrhage does raise difficulties in diagnosis and treatment, but it is a possibility that must be considered where a patient with an undoubted placenta prævia has gross albuminuria and perhaps hypertension.

TABLE III—MORTALITY IN RELATION TO CÆSAREAN SECTION

Series	—	Perinatal mortality	Maternal mortality	Cæsarean section
R.M.H. ..	1937–45	22%	0·52%	41·3%
	1946–53	11·9%	..	76%
	1954–58	12·5%	1·5%	67·7%
Oxford ..	Last 217 cases	9·7%	..	66%
Qureshi ..	1934–39	71·3%	21·9%	8·8%
	1940–45	60·2%	5·8%	26·7%

Treatment

The patient who has had a long spell of expectant treatment has the scales weighted heavily in favour of cæsarean section as the method of treatment most likely to result in a living child. Table III, setting out results in several series, suggests that both maternal and fœtal mortality are lower where the operation is performed often.

In Qureshi's Indian series one would have expected a much greater fall in the fœtal mortality when cæsarean section increased, but he was working in conditions quite different from those of the United Kingdom today. Broadly speaking, the higher the cæsarean-section rate the lower should be the perinatal mortality, provided the patients are being carefully selected and properly treated before operation. Qureshi's series demonstrates the importance of this proviso; for he is forced to deal with patients who have been examined vaginally before admission (table I) or have been admitted in irreversible shock.

Lower-segment cæsarean section is the operation now most frequently performed, but I do not think that the abdomen should be opened with the preconceived idea of invariably carrying out this type of operation. Circumstances may make it difficult—for example:

1. *A poorly developed lower uterine segment.*—This is unusual, but it is very obvious when the abdomen is opened, because all the available lower segment is behind the symphysis pubis, making its exposure difficult. If one persists in trying to perform the lower-segment operation, the lives of both mother and child may be jeopardised. It takes a relatively long time, and almost inevitably the large vessels on either side will be cut or torn.

2. *Adhesions obliterating the operation site.*—This state of affairs is, of course, unlikely unless the patient has had a previous cæsarean section or a low anterior myomectomy.

3. *Marked vascularity of the lower uterine segment.*—This is commonly regarded as an indication for the classical operation, but it need not rule out the segment procedure if the lower uterine segment is well developed and the operator is experienced. Vascularity of the lower segment is common, especially when the placenta is situated anteriorly, and it is an indication for rapid enlargement of the incision in the lower segment, with rapid but careful extraction of the baby.

There are few occasions on which the classical operation has to be performed, and from the point of view of future pregnancies this is fortunate. On the other hand, one must be ready to perform it whenever necessary.

Cæsarean section is desirable in most cases where there is a major degree of placenta prævia, even when the period of gestation is still under 36 weeks. With modern pædiatric care a very large proportion of premature babies can be saved.

The situation of the umbilical cord in relation to the internal os can be of vital importance. Very often the cord is situated excentrically; and usually this does not matter much, because its excentric insertion is far away from the internal os. But where the insertion is just inside the internal os, cæsarean section may be the only means of delivering a live child. The importance of this is evident from the fact that in the first Belfast series (table III) at least 9 of the 33 deaths in babies were directly due to malposition of the cord.

The relation of the cord to the anterior part of the lower uterine segment is also important at a cæsarean section. If it is anterior there is a risk that the cord, or one of the big vessels close to it, may be divided, resulting in the delivery of an anæmic baby. An incision into placental tissue is another indication for rapid delivery of the fœtus.

While cæsarean section has undoubtedly improved the results for both mother and baby, it can have complications necessitating quick decisions and perhaps radical surgery.

Occasionally there is persistent, apparently uncontrollable, hæmorrhage from the lower uterine segment. This may follow the removal of the placenta while the abdomen is still open, and a decision must be made as to whether a hysterectomy is necessary or not. In a multigravida it may be the safest method of treatment, but in a primigravida it will almost certainly be unnecessary. Replacement of blood-loss, and packing the upper and lower segments with gauze (which later can be removed per vaginam), may be all that is required. When bleeding follows closure of the abdomen, it can usually be controlled by the same method, but the intrauterine pack must fill the whole uterine cavity, and ergometrine must be given to make the uterus contract on it.

Placenta accreta is a complication that may have to be faced as soon as the uterus is opened, especially if the placenta is attached to the anterior part of the lower uterine segment. On incising the placenta one sees no line of demarcation between it and the uterine wall, and at this stage there is actually less bleeding than if the implantation was normal. This complication, in association with placenta prævia, is rare, but " in most reported cases of placenta accreta there is a high incidence of implantation of part or all of the placenta in the lower segment " (Millar 1959).

The abnormal adhesion may involve the whole placenta or only the portion attached to the lower segment. Where the whole placenta is involved, or where the condition is one of percreta, hysterectomy has to be performed. Attempts to separate the abnormally adherent placenta are associated with a high mortality from shock and hæmorrhage.

Apparently, a small localised area of placenta accreta can be left with safety, and I have done this on one occasion without untoward result. Kaltreider (1945) quotes 7 cases where the whole placenta was left in situ and all recovered, and Schumann (1940) described 4 cases successfully treated, in the same way, in 2 of which a normal pregnancy followed. Millar (1959) has left the accreta portion in the lower segment in a primigravida of 19 without subsequent complications.

In 1954–58 two women died in the Royal Maternity Hospital, Belfast, from shock and hæmorrhage after cæsarean section.

One was a 9-gravida with a placenta accreta: too much time was spent in trying to remove it manually, and hysterectomy was undertaken too late. The other, a 3-gravida who had had two previous cæsarean sections, was admitted at 26 weeks with a threatened miscarriage. At 34 weeks bleeding was profuse and a classical cæsarean section was performed. This was uneventful, but two and a half hours later she collapsed with uterine bleeding and died.

In the first case a hysterectomy at an earlier stage would almost certainly have saved the patient. In the second case the collapse may have been due to unrecognised postoperative uterine relaxation and intra-uterine bleeding. It emphasises the importance of careful postoperative supervision.

Rupture of the Membranes

Though 60–70% of cases of placenta prævia are now delivered by cæsarean section, artificial rupture of the membranes has still an important place in the treatment of the less severe varieties. The fact that such a large proportion of cases is delivered by cæsarean section suggests that the lesser degrees of placenta prævia are uncommon. But in point of fact many cases of the first degree escape diagnosis because they never have any antepartum hæmorrhage, or nothing more than an excessive show during labour. On the other hand, some minor degrees can bleed quite profusely, and many unnecessary sections will be performed if one makes the mistake of doing cæsarean sections without preliminary vaginal examination.

Where the presenting part can be felt through all the fornices, and the placental edge is reached only after introducing the finger into the lower uterine segment, artificial rupture of the membranes will almost certainly suffice. If the placenta is lying in the second-degree position anteriorly, rupture of the membranes is again likely to be successful. If the placenta is lying posteriorly and the presenting part can be pushed into the pelvic brim without disturbing the fœtal heart, rupture of the membranes is probably the correct treatment in a multipara. If, on the other hand, pressing the fœtal head into the pelvic brim disturbs the fœtal heart, the umbilical cord is almost certainly situated excentrically in close proximity to the lower edge of a second-degree placenta prævia and near the internal os. In such a case rupture of the membranes may result in prolapse of the cord or compression of the cord by the fœtal head, which forces one to perform a rapid cæsarean section in unfavourable circumstances or perhaps be faced with an intrauterine death before the operation can be performed. In addition, the posteriorly situated placenta is more liable to prevent engagement of the head, and persistent bleeding may result from the failure of the fœtal head to compress the separated placenta.

Version

The virtual abandonment of bipolar version has been another important factor in reducing the perinatal mortality, and also, to some extent, the maternal mortality.

This operation has a fœtal mortality of between 60–80% and is now reserved for a few selected cases. It has a definite place where the baby is very immature or already dead, and it is occasionally indicated in the multipara who has a good obstetric history and is in labour with hæmorrhage of such a degree that it must be controlled before any further steps can be taken. Here

the baby may be alive, and may even be born alive if the version is carefully and gently performed, and the placenta prævia is of a moderate or minor degree.

It has been suggested that in these cases a preliminary external version facilitates extraction of the foot and reduces the amount of internal manipulation required. This is true provided the legs are not extended. If they are, it will actually increase the internal manipulation and make the extraction of the foot more difficult.

Apart from the type of case I have mentioned, podalic version now has a very small place in the treatment of placenta prævia in the United Kingdom and most of the Western world.

Criticisms

When I visited the Rhodesias and South Africa as Sims Black professor, I was criticised for my attitude towards the treatment of placenta prævia, and especially for what I said on expectant treatment and cæsarean section. I was told that I had oversimplified the subject and that some of my teaching was not applicable to the African patient—indeed was unwise. In view of what I saw and heard on my visit I believe that some of these criticisms are sound.

I still maintain that the modern treatment of placenta prævia has justified itself; but it depends on hospital and medical facilities which many communities in many countries do not yet possess. I have not visited India, but Dr. Qureshi's paper criticises expectant treatment in a way that demands attention, and expresses opinions which would be valid in South Africa and possibly some Far Eastern countries. He says:

"The present day emphasis on expectant treatment by several authorities notably Macafee (1945), Williamson and Greeley (1945) Johnson (1945) and others and the remarkable reduction in the fœtal mortality reported by them, is likely to excite the enthusiasm of many obstetricians for this method of treatment. But every obstetrician must be alive to the environment in which he is practising and the type of patients he is to treat.

"There are very few hospitals in this sub-continent which are well equipped, well staffed and highly organised. Even if there were a profusion of well-organised institutions, the type of patients we get should not be lost sight of. From my experience of six years at the Lady Willingdon Hospital, Lahore, and Victoria Jubilee Hospital, Amritsar, with obstetric patients, I can state without fear of contradiction that our patients are extremely gullible and lend themselves easily to vaginal examination by dais. Even they make their own vaginal examinations. One of the patients in the present series undergoing expectant treatment in hospital did her own vaginal examination!

"Many of them when admitted to hospital are very co-operative, and ready to accept all conditions for treatment. But later on they get weary. All of a sudden, as if possessed by a demon, they leave the hospital at their own risk. They become completely impervious to otherwise convincing reasoning. No amount of persuasion or vivid presentation of frightful consequences can deviate them from their irrevocable decision to leave the hospital. This applies to all types of cases, whatever their status. The two cases in which death occurred on readmission were private cases!

"In view of these facts, I am of opinion that very serious thought must be given to the prevalent conditions before deciding upon expectant treatment of placenta prævia. At present it should be exception rather than the rule. When an adequate number of well organised institutions comes into being and the patients are delivered from the clutches of ignorant but all powerful dais and they become, through proper education, more susceptible to rational suggestion for treatment and more consistent in their behaviour, then and then alone can the expectant treatment be instituted on a more extensive scale, with perfect safety to the mother."

In South Africa the frequent use of cæsarean section was also criticised not only because facilities for the operation may be inadequate but also because of the risk of ruptured uterus at subsequent confinement and because of the very high infant mortality.

It was pointed out to me that, before leaving a scar in the uterus of a Bantu patient, one must consider her possible subsequent history. Her next baby may be born in the kraal with no expert medical or nursing care and the uterus may rupture and the patient die. In Rhodesia I myself had to operate on a woman who had ruptured a cæsarean-section scar in the Bush two days before admission to hospital.

The infant mortality is relevant because operation on the mother in order to save the child may seem less imperative when the child's prospects of later survival are so much less than they are here. In Port Elizabeth in South Africa the annual report of the Medical Officer of Health shows that in 1955 the mortality per 1000 in the first year of life was:

European	35·87
Eurafrican	135·6
Asiatic	32·26
Bantu (city only)	356·00
All non-Europeans	218·69

From an ethical standpoint this argument is difficult to defend; but with perhaps one child in three dying before the age of 12 months, more weight attaches to the risk of the mother dying of ruptured uterus at a subsequent confinement.

Qureshi feels that in the environment in which he has to work some of the older methods of treatment should be retained: he would advocate the use of podalic version almost as frequently as it was used in this country before 1945, and, despite Prof. F. J. Browne's condemnation of them some years ago, he regards Willett's forceps as valuable. Indeed he uses them even in relatively major degrees of placenta prævia, whether the presentation is a vertex or breech.

Though I rarely use Willett's forceps I believe they occasionally have a place where the placenta is anterior and where some bleeding persists after artificial rupture of the membranes. Gentle traction not only controls the bleeding but stimulates uterine contractions, with the result that the forceps have only to be applied for a short time. But I would not agree with their use in a breech. If the baby is alive, extraction of a foot is the safer and more rational method of treatment: if it is dead, version is safer and more effective.

It is important for us in the United Kingdom to remember that our situation is exceptional in that hospitals, blood-transfusion, and experienced medical and nursing care are never very far from any patient. Elsewhere the distances are often great, the patient is more often ignorant, and the doctors are more likely to lack specialised experience. Only by taking this into account can we appreciate the importance of environmental factors in deciding how to treat a case of placenta prævia.

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THE CARPAL-TUNNEL SYNDROME IN PREGNANCY

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PAIN and tingling in the arms and hands during pregnancy are fairly common symptoms, but relatively little attention has been drawn to them as they often do not arise until the last 3 months of pregnancy, and they tend to improve after delivery. In a few cases, however, the patient is in constant pain during the day and is unable to sleep at night.

This series comprises fourteen patients, all of whom were seen during pregnancy, and all but two also after delivery. Seven had compression of the median nerve only. The other seven had signs of median-nerve compression combined with signs of compression of one or more cervical nerve-roots, suggesting a common pathogenesis. One other patient with signs of bilateral median-nerve compression, seen when she was 74, gave a history of numbness and tingling in her hands for 38 years, the symptoms having started when she was 6 months pregnant with her second child.

Acroparæsthesiæ in pregnancy have been described by Walshe (1945), Garland et al. (1957), and Heathfield (1957), amongst others. Various theories have been put forward to explain compression of the median nerve during pregnancy. Guly (1959) and others believe that salt and water retention is the most important mechanism. Hence diuretics have been given by mouth in treatment with some success (McCallum 1959, Wood 1959). Injection of hydrocortisone 0·5–1·0 ml. into the carpal tunnel may also give dramatic relief in a high proportion of cases, including those associated with pregnancy (Philip 1959).

Ætiology

The main ætiological factors in compression of the median nerve in the carpal tunnel during pregnancy are trauma, a rapid or unusually great increase in weight, and, perhaps, changes in fluid content or tension of the ligaments. But relaxation of the carpal ligament can only be important if it causes the relation of the structures in the carpal tunnel to be changed. Pre-existing cervical spondylosis seems to play a part in the syndrome, possibly by partially damaging nerves so that further pressure causes symptoms.

Trauma

It has been recognised for some time that trauma may produce the symptoms of compression of the median nerve in the carpal tunnel (Brain, Wright, and Wilkinson 1947), and any occupation involving forcible dorsiflexion of the wrist may precipitate them. Many household jobs come under this heading. Three patients started to get symptoms when they gave up a sedentary office job and started doing housework, in one shortly after cleaning a large carpet, and in another after interior decorating. In another the symptoms appeared very early in pregnancy (the 13th week), 5 weeks after she had taken a job which involved lifting heavy laundry baskets. Seven patients gave a history of trauma just before the onset of their symptoms.

Weight Increase

Chesley (1944) estimated that the average woman gains 24 lb. during pregnancy—that is an average increase of 24% of the prepregnancy weight. Two-thirds of all pregnant women gain 13–35 lb., one-sixth more than 35 lb., and one-sixth less than 13 lb. The average gain in weight during the first 3 months of pregnancy is not more than 3 lb., but during the 2nd and 3rd trimesters the gain averages 1 lb. per week until shortly before labour, when up to 3 lb. may be quickly lost. The loss continues postpartum, but afterwards there is a net gain of 6 lb. Five patients in this series gained 30 lb. or more in weight during their pregnancy. One patient gained 60 lb. during her second pregnancy. During her first pregnancy the gain in weight had not been excessive, and she did not have symptoms in her hands. In the second pregnancy paræsthesiæ came on early, affecting her right hand in the 19th week, by which time she had already gained 27 lb. Paræsthesiæ did not affect her left hand until the 33rd week. In four other patients there was marked increase in weight; in three paræsthesiæ developed within 4 weeks of a rapid gain in weight, the average increase being 10 lb. in 4 weeks.

Relaxin

Hisaw (1926) postulated a hormone, relaxin, which had a specific effect on the relaxation of the symphysis pubis in the guineapig. Sands (1958) showed that this hormone modifies the pelvic joints in pregnancy, and Sands and Stone (1959) showed that relaxin is a protein or polypeptide soluble in water and highly stable. It has been demonstrated in the blood of pregnant women, increasing in concentration until the 38th week, and disappearing rapidly within 24 hours of parturition. Boucek (1955), using a sponge-biopsy technique, studied the histochemical characteristics of connective tissue in different age-groups. He showed that when the host was treated with relaxin the collagen-fibres became finer and more widely separated, the ground substance was depolymerised, the mast-cells increased in number, and more fluid was imbibed.

The increase in fluid intake may be important in producing the symptoms of median-nerve compression in pregnancy, as it would increase the volume of the contents of the carpal tunnel. Since all ligaments tend to relax during pregnancy, it is reasonable to suppose that those of the carpal tunnel are involved, and that alteration of the stresses and strains at the wrist may play some part in the production of symptoms.

Other Factors

Posture during sleep may be important. Four patients were more comfortable sleeping on their backs during the last few weeks of pregnancy, and five found that the paræsthesiæ were worse if they slept on the affected side. During the day fluid tends to accumulate in the legs, but this tendency is reversed at night when the patient lies flat. This redistribution of fluid may play some part as the symptoms were always worse at night or on waking, even when they persisted through the day. Because radiographic changes were not very conspicuous in the cervical spine, the factors discussed above may have contributed to the radicular symptoms when these were present.

Clinical Features

Symptomatology

All the patients in this series complained of numbnesss, tingling, or pain in the fingers of one or both hands.

In the majority the numbness was in the thumb, index, and middle fingers, or in the index and middle fingers. In one the index, middle, and ring fingers were affected, and in another the ring and little fingers were worse although all the fingers were affected. Twelve of the patients were right-handed, and in all but two the symptoms started in the dominant hand. In nine one hand only was affected, and in the other five both hands were involved. Where both hands were involved the dominant hand was affected earlier in three and the symptoms came on in the opposite hand 1, 9, and 14 weeks later. In two cases both hands were involved simultaneously.

Pain in the neck and shoulder was experienced in two cases, and pain in the wrist and forearm in five.

Seven patients had objective swelling or feelings of

tenseness of the hands; in one swelling was so severe that she had to have her wedding ring cut off. No patient in this series had toxæmia of pregnancy. Backache was not common, occurring in only four patients.

Of the seven patients with symptoms due to a combination of median-nerve and cervical-root pressure four showed flattening and one showed exaggeration of the normal cervical curve. The seven patients with median-nerve compression only were slightly younger than those with both nerve and root compression (26·7 years compared with 29·7 years). In five cases the symptoms appeared during the first pregnancy.

None of the patients had had symptoms for long. The average time for the whole group was 10·1 weeks, for those with median-nerve compression only it was 7·9 weeks, and for the mixed group 12·4 weeks. The symptoms usually improved after delivery; in four patients they disappeared within 48 hours but in most residual symptoms persisted for 1–4 weeks. One patient improved while she was resting in bed for 2 weeks before delivery. In two the symptoms persisted. One of these required decompression of the median nerve 10 months after delivery; this was the only patient needing operation. The other patient who did not improve continued to have pain in her arms, and radiographs 9 months later showed the characteristic changes of cervical spondylosis.

Physical Signs

Impairment of awareness of pinprick or cotton-wool in the distribution of the median nerve was the most common sign, being found in eleven of the fourteen patients. Only three showed wasting and weakness of the thenar muscles. Reflex changes were found in five patients who had compression of the median nerve and of one or more cervical nerve-roots; one or both triceps jerks were diminished in four, and the biceps jerks in one. Movement of the cervical spine was limited in three patients, and in three there was drooping of one shoulder. One patient who was heavily built had a short thick neck with a marked upper dorsal kyphosis.

Radiological Changes

The cervical spine was X-rayed in twelve cases. Eight showed slight loss of the normal curve, four had diminution of one or more disc spaces, and two showed narrowing of the intervertebral foramina. Since none of the patients gave a history of injury to their wrists these were not X-rayed routinely.

Treatment

Because the symptoms were usually worse at night or in the early morning sleeplessness was one of the main complaints. Hence a sedative such as amylobarbitone sodium was given, together with an analgesic. Patients were advised not to lie on the affected arm, as this tended to make the symptoms worse. In most cases this was the only treatment required.

Splinting was sometimes helpful, being used for three patients; one improved a good deal, another improved slightly, and the third was unchanged. A light splint, applied to the dorsal surface of the wrist, was bandaged around the palm and forearm, the wrist being kept in the neutral or slightly flexed position. The palmar surface of the wrist should never be splinted as this tends to increase the pressure on the median nerve, making the symptoms worse.

During pregnancy the symptoms are rarely sufficiently severe to require immediate operation, and, as they tend to improve spontaneously during the puerperium, operation should be delayed until after delivery. Symptoms persisted after delivery in only one patient in this series; she was operated on several months later, with relief.

Where the symptoms were due to compression of the median nerve and cervical nerve-roots sedation was combined with active exercises for the neck and shoulders. Seven patients were so treated, with some improvement in four.

Summary

In fourteen patients symptoms due to compression of the median nerve in the carpal tunnel appeared during pregnancy. Seven also had symptoms of cervical radicular lesions.

Trauma may precipitate the median-nerve compression in some cases, but the metabolic changes, and especially fluid retention, associated with pregnancy appear to be the main causal factor.

The immediate treatment is symptomatic. Since most patients recover spontaneously after delivery, operation should be deferred and is then rarely necessary.

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HYDROCORTISONE AND THE CARPAL-TUNNEL SYNDROME

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THE commonest cause of acroparæsthesiæ limited to the distribution of the median nerve in the hand is now widely accepted as compression of the median nerve in the carpal tunnel. Since the initial description by Brain et al. (1947) of symptomatic relief by simple retinacular section many reviews of the pathogenesis of the syndrome and its surgical treatment have appeared (Woltman 1941, Nissen 1952, Kremer et al. 1953, Grokoest and Demartini 1954, Garland et al. 1957, Heathfield 1957, Phalen and Kendrick 1957, Vainio 1957, Dick and Zadik 1958, Wiley 1959).

Acroparæsthesiæ in the median-nerve distribution may occasionally arise in the course of systemic disease, such as rheumatoid arthritis, myelomatosis, or amyloidosis (Grokoest and Demartini 1954, Keith 1957). The syndrome not infrequently follows fractures at the wrist, and it may be associated with ganglia of tendon sheaths or with capsular thickening of rheumatoid disease of the wrist-joint itself. But most cases arise in middle-aged women without general disease or local lesion at the wrist.

If compression of the median nerve is secondary to non-specific thickening of the tendon sheaths entering the carpal tunnel, then the nocturnal exacerbations which are so constant a feature may well be due to the increase in bulk of this enclosed tissue by the generalised vaso-

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INITIAL FINDINGS AND RESULTS IN TWENTY CASES OF CARPAL-TUNNEL SYNDROME TREATED BY HYDROCORTISONE INJECTIONS

Case no.	Sex	Age (yr.)	Side affected	Duration of symptoms (mos.)	Symptoms						Associated disorder	Results of treatment*								
					Pain	Numbness	Tingling	Arm pain	Weakness of abductor pollicis brevis	Sensory loss		Weekly assessment			6-weekly follow-up	Intermediate follow-up (mos.)	Intermediate result	Final follow-up (mos.)	Final result	Time of relapse (mos.)	Operation
												1	2	3							
1	F	41	R	3	+	+	+	+	..	..	..	+	++	c	c	7	c	15	c	..	..
2	F	48	L	1½	+	+	+	+	..	+	Goitre	+	c	c	c	6	c	..	?	..	?
3	F	45	R	5	+	+	+	..	..	..	..	+	c	c	c	4	r	13	–	..	..
4	F	65	L	8	+	+	+	..	..	+	Diabetes	–	+	++	c	5	c	14	c	..	..
5	F	40	L	6	+	+	+	..	..	..	Diabetes	c	c	c	c	5	c	14	c	..	..
			R	6	+	+	+	..	..	..		c	c	c	c	5	c	14	c	..	..
6	F	44	R	6	..	..	+	..	..	..	Epilepsy	+	++	c	c	4	c	12	r	4	..
7	F	52	L	18	..	+	+	..	..	..	Epilepsy	+	c	c	c	5	c	13	r	6	+
			R	..	..	+	+	..	..	..		–	+	c	c	5	c	13	r	6	+
8	F	51	R	6	+	+	+	+	..	..	Depression	–	+	c	c	4	c	12	r	5	+
9	F	51	R	36	..	+	+	+	..	+	..	+	++	++	c	4	c	12	r	6	+
10	F	51	L	6	..	+	+	..	..	..	..	+	+	c	c	6	c	15	r	11	..
11	F	25	L	1½	..	+	+	..	..	..	Arthritis	c	c	c	c	8	c	16	r	14	..
			R	2	..	+	+	..	..	..		c	c	c	c	8	c	16	r	14	..
12	M	25	L	3	+	+	+	+	..	..	Diabetes	++	c	c	c	6	c	15	r	9	..
			R	3	+	+	+	+	..	..		++	c	c	c	6	c	15	r	9	..
13	F	47	R	12	..	..	+	..	..	..	Epilepsy	+	++	++	c	3	c	14	r	6	..
14	F	41	R	3	+	+	+	+	..	..	Anxiety state	–	–	–	–	3	–	..	..	..	+
15	F	43	R	9	+	..	..	..	..	..	Diabetes	–	–	–	–	4	–	..	..	..	+
16	M	62	R	2	+	+	+	+	+	+	Cardiac infarction	+	+	+	+	3	+	11	r	8	..
17	F	52	R	24	+	+	+	..	..	..	..	+	++	++	++	6	++	16	r	15	..
18	F	45	R	3	+	+	+	..	..	+	Depression	–	–	++	c	4	c	12	c	..	..
19	F	64	L	6	+	+	+	..	..	..	..	–	–	+	++	5	++	12	r	6	..
			R	18	+	+	+	..	+	+		–	–	++	++	5	c	12	c	..	+
20	F	54	R	9	+	+	+	..	+	+	Diabetes	–	–	++	c	5	r	14	–	..	..

* + = some improvement; ++ = great improvement; – = no improvement; c = symptom-free; r = recurrence of symptoms.

dilatation of deep sleep. The constant trauma provoked by flexion-extension movements at the wrists has been invoked as the cause of the more persistent symptoms on which these characteristic exacerbations are superimposed.

Non-specific inflammatory swelling of soft tissues responds well to the injection of hydrocortisone. Hence, drawing a loose analogy between the tenosynovial swelling of the flexor tendons in and above the carpal tunnel and the synovial thickening of the rheumatoid joint, I decided to observe the effect of hydrocortisone instilled into the carpal tunnels of a series of patients with median-nerve acroparæsthesiæ, as suggested by Phalen and Kendrick (1957).

Investigation

The Patients

Twenty patients were referred from the outpatient department of a general hospital for treatment (see table).

All fulfilled the criteria of pain or paræsthesiæ in the median-nerve distribution of the hand for more than 6 weeks, aggravated by exercise at the wrist, and with nocturnal exacerbations. Some had unrelated systemic disorders as shown in the table. Sensation (light touch, pinprick, and two-point discrimination) was examined in all cases, and the muscles supplied by the median nerve were tested for power, particular attention being paid to the strength of the abductor pollicis brevis. Radiographs of the cervical spine were taken in each case to exclude " cervical rib ".

Technique

Hydrocortisone tertiary butyl acetate (Merck) 1 ml. (25 mg.) was injected into the volar aspect of the wrist at the junction of the medial edge of the palmaris-longus tendon and the proximal border of the retinaculum. Three injections were given into each wrist at weekly intervals, and the symptoms and signs were reviewed each week thereafter.

The skin was prepared with spirit and iodine. A ' Star ' 20 needle (1·5 cm. long) was used, being introduced to maximum depth at an angle of 45° to the surface of the arm in its longitudinal axis. (Injection of the wrists of cadavers with coloured solution confirms that the substance comes to lie deep in the tunnel, so that on movement it will circulate amongst the tendons below the retinaculum, coming into contact with the nerve itself on its deep aspect.) Patients were encouraged to use the hand after injection and not to restrict their activity.

Results

The progress of each case is shown in the table. Of the twenty patients, one wrist only was affected in fifteen. Of these, ten had become symptom-free 3 to 8 months after the third injection of hydrocortisone. Of the other five patients in whom both wrists were involved, eight wrists became similarly symptom-free. Three of the remaining seven wrists improved so much that the symptoms became tolerable and the patients did not wish to have further treatment. In two others the symptoms recurred after a period of improvement, and the remaining patients who had in no way benefited by injection, were referred for operation.

Thus twenty-five carpal tunnels were injected with complete relief of symptoms in twenty, partial relief in three, and no improvement in two. Assessment after 12 months, however, showed a high relapse-rate in those who had initially improved, symptoms recurring in fourteen wrists. Of the original twenty who obtained complete relief only six were symptom-free after 12–14 months, and five more needed surgical treatment.

Discussion

Most patients who responded did so after the first injection. Many experienced an exacerbation of symptoms during the 24 hours after injection, which was never prolonged. But in view of this the injection of more than 1 ml. of fluid into an already tightly packed compartment is probably unwise. Only seven cases showed objective signs of median-nerve damage—namely, clinically detectable sensory loss and thenar atrophy—and these signs had not improved at the time of intermediate follow-up (see table).

This investigation suggests that hydrocortisone injected

into the carpal tunnel by the above technique will give temporary relief of acroparæsthesiæ in many cases without evidence of severe median-nerve damage, and more permanent relief in a few. A larger group of patients is now being studied to discover whether nerve conduction-time is improved by the procedure, which provides a relatively painless and economical alternative to surgical treatment.

Summary

Hydrocortisone was injected into twenty-five carpal tunnels of patients with median-nerve compression.

The symptoms remitted completely in twenty cases, three derived some benefit, and two did not improve.

This form of treatment, which is simple, relatively painless, and economical, may be preferable to operation in early cases without evidence of severe median-nerve damage, or with some contraindication to surgical treatment. Unfortunately the relapse-rate is high.

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A HITHERTO UNDESCRIBED PHENOMENON IN ABO HÆMOLYTIC DISEASE OF THE NEWBORN

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THE serological diagnosis of ABO hæmolytic disease of the newborn is sometimes very difficult. The Coombs test is generally negative or very weakly positive, and the titre or nature of the maternal antibodies bears no clear-cut relationship to the severity of the baby's affection. For early diagnosis many tests involving examination of the cord blood have been suggested; none is reliable; and close observation of all newborn children and measurement of indirect-reacting serum-bilirubin whenever early or deep jaundice exists, are the only sound guides to diagnosis and treatment (Tovey et al. 1959).

The aim of the present paper is not to add a further test but to describe a phenomenon which until now does not seem to have been observed. Erythrocytes suspended in an agglutinating serum sediment more quickly than those suspended in a compatible serum (Sander and Sander 1939, Stats 1950). We have shown that the hastening of the sedimentation is conditioned by, among other factors, the intensity of the agglutination, the packed-cell volume of the preparation, and the nature of the medium in which the agglutinated cells are suspended (Lewi 1954). We therefore decided to investigate the behaviour in this respect of erythrocytes from infants with hæmolytic disease. Obviously, the erythrocyte-sedimentation rate (E.S.R.) of whole cord blood cannot have any significance for this purpose; the E.S.R. of cord blood is always very low (much lower than that of normal adult blood) owing to the composition of newborn's plasma (poor in α and β globulins and in fibrinogen) and to the high hæmatocrit level; whereas the tendency towards rouleaux-formation is the same in fœtal and in adult cells (Lewi 1955). Thus, for study of the action of antibody fixation on the red corpuscles of the baby, it is necessary to compare samples containing erythrocytes entirely free of plasma, suspended in a constant medium under a constant concentration.

Material and Methods

Unclotted cord-blood samples were obtained on heparin (0·1 mg. of pure heparin per ml. of blood). The blood was centrifuged, the plasma removed, and the cells washed three times in neutral-phosphate-buffered isotonic saline solution. The red cells, as completely packed as possible, were mixed with polyvinyl-pyrrolidone (P.V.P.) medium, and prepared as described later, in the proportion of 1 vol. of packed cells to 3 vol. of P.V.P. medium. The tubes were shaken gently and sedimentation was carried out in a Westergren tube (200 mm. high, 3 mm. internal diameter). Readings were taken every 5 minutes. The 10 min. and 15 min. readings are of the most interest.

The P.V.P. medium was made up by diluting 25% concentrated P.V.P. ('Subtosan retard', Specia) in normal isotonic saline. The dilution was chosen in such manner that a 1 : 3 (v/v) suspension of fresh cord erythrocytes, washed and packed as above, of normal ABO-compatible full-term infants showed an average E.S.R. of 5 mm. in 10 minutes. The final dilution of P.V.P. giving such a result varied widely between different batches, and may range between 1% and 2·4%. Once the dilution has been determined, the same batch may be used for several hundred tests.

Many hæmatological and immunological tests were performed simultaneously on the cord-blood samples: they will not be described here.

Mother's blood for titration of incompatible anti-A or anti-B antibodies was obtained generally on the day of delivery, but sometimes 1 or 2 days afterwards. Titration was made on A_1 or B adult red cells (1) in saline at room temperature and (2) in human AB serum at 37°C; hæmolysins, if present, were titrated in inactivated serum to which fresh human group-O serum known to contain no hæmolysins had been added.

The newborn children were looked after by the hospital pædiatrician. When necessary, hæmatological examinations and indirect-reacting bilirubin measurements in the baby's serum served as a guide for treatment, independently of our laboratory findings. The policy was to perform an exchange-transfusion with group-O blood when the indirect bilirubin reached 20 mg. per 100 ml., and a simple transfusion of packed cells when the red-cell count dropped below 3×10^6 per c.mm. Most of the children with deep jaundice, compatible or incompatible, received cortisone treatment (10–20 mg. of Δ-cortisone by mouth daily for 3 or 4 days).

Results

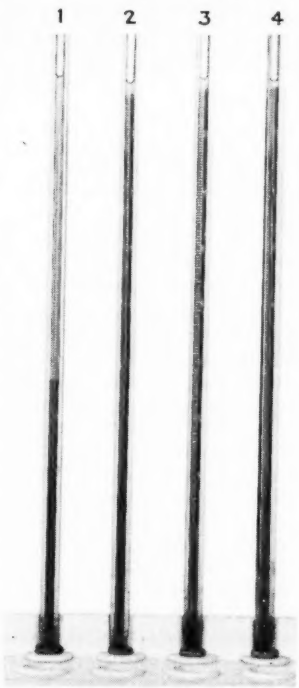
Of 3924 cord-blood samples, 835 were incompatible in the ABO system with the mother's group. (Children affected by Rh-hæmolytic disease, stillbirths, and children who died or left the clinic less than 3 days after birth are not counted.) The distribution of incompatible children was as follows:

Mother O, child A	416 cases
Mother O, child B	147 „
Mother A, child B or AB	146 „
Mother B, child A or AB	126 „

The sedimentation of *compatible* cord red cells in P.V.P. medium conformed to a rhythm which was the same in all blood samples examined: the fall of 5 mm. in 10 minutes, chosen as an arbitrary reference, continued at the rate of 5 mm. every 5 minutes, and packing was not complete after $1^1/_2$–2 hours. The same sedimentation rate was

observed in compatible blood of premature children and those with obstetric complications, and even those who died a short time before labour or during labour.

The sedimentation of *incompatible* cord red cells, on the other hand, varied greatly from one sample to another, and striking differences were seen most easily by simultaneous observation of a series of tubes. Between a normal range and a much-hastened sedimentation-rate there was a whole range of intermediate rates which by means of the 10-min. and 15-min. readings could be divided into three categories:



Sedimentation of four samples of cord-blood erythrocytes in P.V.P. medium after 10 minutes. Tube 1: child with ABO hæmolytic disease (case C, table I); tubes 2-4, healthy group-A children of group-O mothers.

1. *Greatly accelerated sedimentation.*—The fall of the red cells was most dramatic. After 10 minutes the column of clear supernatant fluid amounted to 90 mm. or more. The erythrocytes packed at the bottom of the tube were clearly delineated from the supernatant liquid, in which only a few unagglomerated cells persisted. 10-minute readings of blood from group-A children of group-O mothers are shown in the accompanying figure. Tube 1 contained the blood of an infant with hæmolytic disease (case C, table 1) and it contrasts sharply with tubes 2–4, containing blood of healthy infants.

Such a much-accelerated sedimentation-rate has been found in only 8 out of 835 incompatible cord bloods; all 8 were of mother O/child A.

2. *Moderately accelerated sedimentation.*—The 10-min. readings did not show a clear delineation between the packed cells and those remaining in suspension. The supernatant liquid became transparent gradually; the density of the red cells increased progressively from top to bottom, and at the lower extremity of the supernatant fluid small clusters of agglomerated erythrocytes could be seen distinctly with the aid of a lens. In contrast, the 15-min. reading showed a massive red-cell deposit separated from the supernatant by a neat line of demarcation.

Such a type of sedimentation was found in 25 out of 835 incompatible cord bloods—23 times in the combination of mother O/child A, and twice in the combination of mother O/child B.

3. *Normal or slightly accelerated sedimentation.*—In this category we have included all cases in which the 15-min. readings showed no important sedimentation, such as a compact layer of red cells separated by a neat demarcation line at least 85 mm. below the upper limit of the tube.

In many cases incompatible cord red cells did not settle more quickly than compatible ones. In compatible ABO children affected by Rh hæmolytic disease the sedimentation of cord erythrocytes in P.V.P. medium was not distinctly modified: out of 20 cases we found 17 normal sedimentation-rates, and in the other 3 cases the sedimentation-rate was very slightly accelerated (20 mm. at 15-min. readings instead of 10 mm. as in normal ABO compatible children).

In each of the 8 cases where the cord-E.S.R. in P.V.P. was strongly increased the child had severe hæmolytic disease. 4 of them showed both early anæmia and high indirect bilirubin levels, and underwent exchange-transfusions. In 1 case anæmia (Hb 11·5 g. per 100 ml.) and hyperbilirubinæmia (17 mg. per 100 ml.) existed in a child 5 days old, at which age the infant left the clinic with its mother, who refused treatment. In 2 cases the indirect bilirubin never reached a dangerous level, but the children had to be transfused with group-O packed

TABLE I—DATA CONCERNING 8 CHILDREN WITH GREATLY INCREASED SEDIMENTATION-RATE OF CORD CELLS IN P.V.P. MEDIUM (ALL CHILDREN GROUP A, MOTHERS GROUP O)

Case	Maternal anti-A antibody at delivery			E.S.R. of cord cells in P.V.P. medium (mm.)		Osmotic fragility: Hæmolysis *		Clinical condition of infant and treatment	Previous family history
	Saline	Human AB serum 37° C	Hæmolysin	10 min.	15 min.	Initial	Complete		
A	128	1024	4	104	108	0·62	0·42	Full-term, 3·120 kg.; early jaundice and anæmia; 2 exchange-transfusions	Primipara
B	128	1024	8	130	132	0·62	0·42	Premature, 7½ months, 2·520 kg.; early jaundice and anæmia; 1 exchange-transfusion	8 previous children (group unknown) unaffected (?); 3 miscarriages
C	512	16,000	32	105	118	0·65	0·45	Full-term, 3·460 kg.; early jaundice and anæmia; 1 exchange-transfusion; child died at 1 month (cardiac malformation)	2 first children A_1 unaffected; 3rd dead at birth; 4th A_1, exchange-transfusion; 5th A_1 affected and transfused; 1 miscarriage
D	256	4096	4	100	118	0·65	0·38	Full-term, 2·620 kg.; early jaundice and anæmia; transfusion of packed cells	Primipara
E	256	512	1	96	100	0·65	0·42	Full-term, 3·560 kg.; early jaundice and anæmia; transfusion of packed cells	1st child (group unknown) unaffected; 2nd A_1 early jaundice not treated
F	1024	8192	8	87	92	0·52	0·35	Full-term, 3·500 kg.; early jaundice and anæmia; left clinic at 5 days without treatment	Primipara
G	512	2048	2	97	110	0·55	0·35	Full-term, 3·590 kg.; early jaundice and anæmia; 1 exchange-transfusion	1st child A_1 unaffected
H	128	512	2	85	110	0·55	0·35	Full-term, 3·880 kg.; no jaundice or anæmia until 5th day; late anæmia (1 month) treated by transfusion	1st child group O unaffected

* Normal range with our technique in phosphate buffered saline: initial hæmolysis, 0·50–0·55; complete hæmolysis, 0·30–0·35.

TABLE II—INCIDENCE OF NEONATAL JAUNDICE IN 3924 INFANTS

Blood-groups	Sedimentation of cord red cells in P.V.P. medium	No. of cases	No jaundice	Slight jaundice	Deep jaundice	Exchange transfusion
Mother O, child A ..	Greatly accelerated	8	1	0	7	4 (twice in 1 case; see table I)
	Moderately accelerated	23	4	4	15	1
	Normal or slightly accelerated	385	241	121	23	0
Mother O, child B ..	Moderately accelerated	2	0	0	2	0
	Normal or slightly accelerated	145	91	44	10	0
Mother A, child B or AB..	Normal or slightly accelerated	146	96	42	8	0
Mother B, child A or AB..	Normal or slightly accelerated	126	82	37	7	0
Compatible children ..	..	3089	2039	886	164	1 (full-term infant)
Total	..	3924	2554	1134	236	6

cells in the first week of life to correct anæmia. In 1 case no anæmia or jaundice was observed until the child had left the clinic (5 days), but at the age of a month the child was admitted to a children's hospital with anæmia. The data concerning these 8 cases are summarised in table I.

In the 25 cases where the sedimentation-rate was moderately increased, the incidence of deep jaundice was very high (17 cases out of 25), and no anæmia was noticed; 16 of the children recovered without special treatment, although in 11 cases the indirect bilirubin reached very high, but not dangerous, levels. In 1 case an exchange-transfusion had to be performed at the 4th day on account of hyperbilirubinæmia. Of the 8 remaining cases slight jaundice was observed in 4, but serum-bilirubin was not measured.

Among all other cases of ABO incompatible infants whose cord-erythrocytes showed a normal or slightly accelerated sedimentation in P.V.P. medium the incidence of deep jaundice was not significantly greater than in the control group of ABO compatible children (table II). In this last group, 1 full-term infant had to undergo an exchange-transfusion on account of hyperbilirubinæmia of undetermined origin.

Discussion

The phenomenon described here is the outcome of several years' research concerning ABO hæmolytic disease of the newborn and, principally, the means of early diagnosis. We have studied most of the tests evolved for this purpose; all have been found disappointing. In our experience, the hæmatological anomalies—i.e., anæmia, high reticulocytosis, microspherocytosis, and increased osmotic fragility of the cord-erythrocytes—are very frequently absent in affected children. By contrast, immunological tests are very often positive in perfectly healthy infants, especially in group A or B infants whose O mothers have a high-titred incompatible antibody. Rosenfield's (1955) modified Coombs' test and the agglutination of cord-erythrocytes in macromolecular media is so often positive (sometimes quite strongly) in infants without jaundice that these tests cannot be taken into practical account. Moreover, in healthy infants the presence of incompatible maternal antibody free in the cord serum *and* attached to the cord-erythrocytes, which give it up by elution, is sometimes observed, thus proving that the passage of incompatible antibody across the placenta and even its fixation on the child's red cells does not by itself always give rise to hæmolytic disease. Something else must occur—perhaps modifications of the cell surface which manifest themselves in the agglutination of the erythrocytes in macromolecular media. Such modifications do not seem to be a constant consequence of fixation of antibody on A or B cells. The effect of such modifications is generally not deleterious for the red corpuscles, unless they reach a great intensity; and the intensity is not necessarily proportional to the amount of antibody fixed.

Unfortunately, this intensity cannot be determined by a slide agglutination test. We have tried to measure it by means of the sedimentation-rate, just as the intensity of rouleaux-formation of erythrocytes in their own plasma is measured by this technique. The results, reported here, are very promising. In all cases where the sedimentation-rate was greatly accelerated the children had severe hæmolytic disease, with anæmia and with or without hyperbilirubinæmia. In cases with a moderately increased sedimentation-rate hyperbilirubinæmia was quite common; but this was not associated with anæmia and in our series required no special treatment, except in 1 case; moreover, in certain of these cases no jaundice was observed, so probably the immunological process played only a subsidiary role in the genesis of the disease. In the cases where the cord-red-cells' sedimentation-rate was normal or only slightly increased, the incidence of deep jaundice was not significantly greater than in the compatible children. In such cases when jaundice occurs the incompatibility plays probably a very small role, if any, whatever the nature and titre of maternal antibody.

The phenomenon described here is observed only in hæmolytic disease due to ABO incompatibility. The cord-red-cells' sedimentation-rate is normal or only very slightly increased in even severe Rh hæmolytic disease in ABO compatible children, showing that in this disorder the cellular modifications are quite different. This difference of behaviour of cord-erythrocytes in ABO and Rh hæmolytic disease was observed by Munk-Andersen (1958) with his dextran/human-serum medium.

A more detailed report of our work on ABO hæmolytic disease will appear elsewhere.

Summary

The sedimentation-rate of washed cord erythrocytes suspended in a P.V.P. medium was found to be greatly increased in severe ABO hæmolytic disease, and moderately but distinctly increased in most of the less severe cases.

This phenomenon may prove useful in the study of cell changes in ABO hæmolytic disease of the newborn.

We wish to thank Prof. M. Mayer and Dr. P. Walter, obstetricians, Saint-Antoine and Rothschild Hospitals, and Dr. P. Ducas, pædiatrician, Saint-Antoine Hospital, for their cooperation and interest. We are grateful to the midwifery staff at both hospitals—especially to Miss A. Dinovetzky for the collection of cord-blood samples.

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SURGICAL RELIEF OF SEVERE PARALYTIC HIP CONTRACTURE

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THIS paper reports favourable results of an attempt to relieve the severely crippling deformity of the hip which follows untreated anterior poliomyelitis in Uganda. The appearance of a child so afflicted suggests the need for extensive surgery involving many operations over a long period. Because most of these cases are in countries where neither hospital beds nor operating facilities suffice for this type of treatment, the children are left alone. They grow up as helpless cripples, with the prospect of only a short miserable existence, without schooling and without any hope of earning a living except by begging. If the child can be enabled to walk upright he can be sent to school and thus become a useful member of society. The procedure to be described reduces bed-occupancy and operating-time to a minimum, and can be followed wherever there is basic medical equipment. Its simplicity will appeal to those in medical charge of isolated hospitals in underdeveloped countries. Its effectiveness may lead to a reappraisal of the need for the major operations which form the orthodox treatment in orthopædic centres.

A child may be brought for advice because of a limp due to mild flexion deformity of the hip-joint after an attack of anterior poliomyelitis. Full flexion of the contralateral hip-joint eliminates lumbar lordosis and often reveals a greater degree of contracture than was at first expected. More often gross deformity is present (fig. 1), and the child is unable to walk, but crawls on all fours, or sits crouching in a fixed " tailor's position ". The hips are then flexed, externally rotated, and abducted, the knees are flexed, and the feet plantar flexed.

Before a child in this condition can be taught to walk upright with crutches and callipers, various problems must be overcome. Deformity at the knee can be corrected by repeated manipulations and plasters. Subcutaneous tenotomy of the tendo Achillis (White 1943, Cummins et al. 1946) will relieve fixed plantar flexion. No equally simple method of relieving flexion contracture at the hip has been found in the literature.

The operation described by Campbell (1923), and since modified in many ways, is a major procedure involving detachment of the glutei from the ilium, and open division of all structures anterior to the hip joint. The contracture is effectively overcome, but apart from the time taken in the theatre over an extensive dissection, there are several disadvantages. Because it is a major procedure it is impracticable for both sides to be treated at the same time in bilateral cases, even if blood-transfusion is available. A full plaster spica is invariably required, and the stay in hospital lasts several months while repeated operations are also performed on the knees and ankles. The approach to the hip results in all the muscles around the joint being either detached from their origins or divided, whether they are paralysed or merely contracted. After operation the hip thus tends to become flail and unstable. For this reason greater difficulty has been experienced in training a child to walk after this operation than after the simpler procedure described below.

Fig. 1—Severe contracture of knees and hips in boy of 9 years, unable to do more than sit at home during past four years.

In February, 1958, Mr. Robert Roaf demonstrated a method he had developed in India when facing problems similar to our own. The basis of his operation was multiple subcutaneous division of the fascia lata. Successful application of this method depends on an understanding of the factors causing deformity in late poliomyelitis. The following analysis is based upon experience in treating 286 patients with varying types of paralysis of the lower limbs.

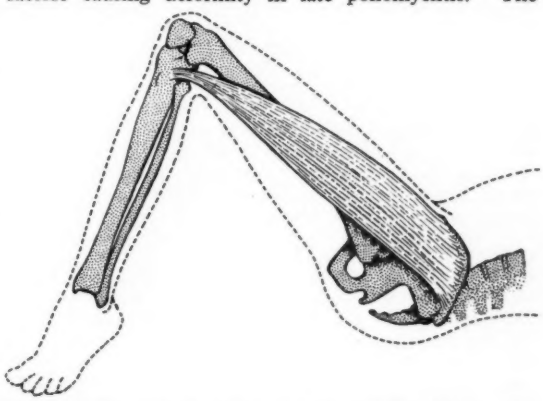

Fig. 2—Diagram showing effect of shortened iliotibial tract on knee- and hip-joints.

How Deformity is Produced

The deforming forces are multiple, but may be divided into those which begin to operate soon after the onset of paralysis, and those which later perpetuate the deformity.

The *initial deforming force* is the loss of balance between the paralysed muscles and their antagonists. Thus in the hip region the gluteus maximus and hamstrings are often paralysed, whereas the iliopsoas escapes, drawing the thigh up into a flexed position; or there may be loss of adductor power with continued action of the gluteus medius causing abduction. Loss of the glutei together with adoption of the squatting posture will result in external rotation at the hip.

The *later deforming force* results from the propensity of collagen fibres to shorten, taking up the slack between two points of attachment. This force is inherent in the following structures relevant to the hip:

(1) The fascia lata of the iliotibial tract will shorten as its point of attachment on tibia and crest of ilium come closer together. The tract stays as a rigid band and cannot be stretched by any manipulative force alone (fig. 2).

(2) Unopposed intact muscles will shorten and may need considerable force applied over a long period to stretch them out to their normal length. Iliopsoas muscle is the most important example of this.

(3) A paralysed muscle may be overstretched, undergoing fibre atrophy and dense interstitial fibrosis.

Roaf's Operation

Underlying Principles

The type of operative correction to be described avoids interference with normal tissues and deals with the deforming forces as follows:

(1) The shortened fibres of the iliotibial tract, together with its deep attachments to the femur, are divided at several points along the lateral aspect of the thigh (fig. 3). This

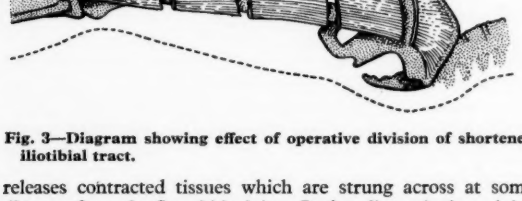

Fig. 3—Diagram showing effect of operative division of shortened iliotibial tract.

releases contracted tissues which are strung across at some distance from the flexed hip-joint. It also allows the knee-joint to be extended, so that relaxation of the quadriceps extensor permits further correction at the hip.

(2) The hip can then be extended by gradually stretching the shortened iliopsoas muscle, and the joint capsule. These structures, in intimate contact with the bony surfaces, can later be stretched gradually by leverage upon the femur. In most cases, extension exercises alone will suffice after operation. In very severe cases stretching under anæsthesia and plaster-spica fixation may be required at intervals of about ten days until full correction is attained.

(3) Hip extension allows stretched paralysed muscle (e.g., gluteus maximus) to assume normal length, and thus to utilise any surviving motor units. This may be the reason for an increase of muscle power which sometimes appears after severe deformity is corrected.

Details of Operation

The patient is given a general anæsthetic and the affected hip and knee are extended as fully as possible. The opposite hip is flexed to eliminate lumbar lordosis. A tenotomy knife is introduced at four or five points along the lateral surface of the thigh, the first proximal to the knee-joint. At each of these points the blade is pressed against the tensed fascia lata, then through the underlying fibrous tissue sheaths and septa of the (usually paralysed) vastus lateralis muscle until the bone is reached. As these fibrous structures are divided, both the knee and the hip joints can be extended progressively.

Fig. 4

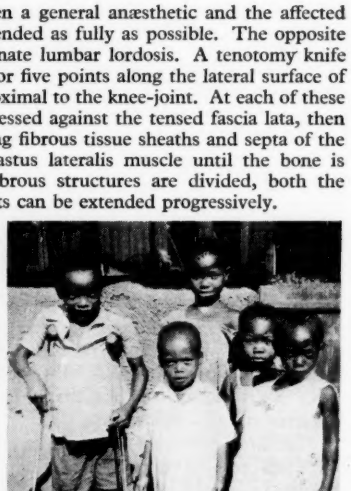

Fig. 5

Fig. 4—Patient in fig. 1 four weeks after operation. Hip spica has been removed and correction is almost complete.

Fig. 5—Same patient at home wearing callipers and now one of the family again.

The femoral vessels are then palpated and guarded by a finger. A tenotomy incision is made, 1 cm. distal to the anterior superior iliac spine. The knife is passed medially parallel to the inguinal ligament until the point lies beneath the skin lateral to the femoral sheath. The blade is then pressed deeply against the tensed fibres of the fascia lata as they stand out under the skin. The origins of sartorius and tensor fasciæ latæ (enclosed within the fascia) are usually divided at the same time, but the knife does not reach as deeply as the capsule of the joint or the tendon of iliopsoas.

Bleeding from division of the superficial iliac circumflex artery may be brisk, but can be checked by firm pressure maintained for a few minutes. The knife is then withdrawn and reinserted at the same place, the point now directed posteriorly. The blade is pressed medially against the remaining fibres of the fascia lata as they pass over the glutei (medius and minimus). The tendons of these glutei are detached from the greater trochanter via a separate incision only if gross abduction deformity is present. Minor degrees of abduction deformity at the hip assist in stabilising the pelvis while walking.

A plaster cast is applied to the leg as its weight assists in maintaining extension of the hip, and later provides a temporary support for walking exercises. When both hips have been treated in this way, the two plaster cylinders are sometimes bridged by a bar of plaster which checks external rotation and prevents the child from lying on his side with the hips flexed. The physiotherapist visits daily, and by gentle passive extension of the hip completes the correction of any deformity remaining after the operation. The child is nursed throughout either flat on his face or on his back.

The most severe degrees of flexion deformity cannot be corrected in this way alone, because of the bowstring effect of the femoral neurovascular bundle across the flexed hip. After operation, therefore, the hip is extended as far as the soft tissues allow, and a plaster spica is applied. This plaster is either wedged or changed at intervals of ten days, until full correction is achieved (fig. 4).

After operation, even in bilateral cases, there is relatively little pain, and some of the younger children are able to start walking by the side of their beds within two or three days. In a fully corrected limb, the plaster is removed some fourteen days after operation, and the child is fitted with boots and simple adjustable length callipers (Burkitt 1959).

Results

So far 32 children have had either one or both their hip contractures relieved by this method. Over the past eighteen months of continued observation there has been no relapse, although in some instances callipers had been temporarily discarded. Once taught to walk, most of the children became determined to remain upright, and they were helped to attend local schools (fig. 5). Regular visits were made to their homes to ensure that their boots, callipers, and crutches were maintained in good condition and changed when necessary. This service is an essential supplement to the operation.

An unexpected result of the operation (performed mainly for deformity of the hip) has been the ease whereby associated flexion contracture at the knee has been relieved. None of the 32 patients so far treated have required osteotomy or open capsulotomy of the knee-joint, even though the original deformity has in some instances been over 90° of fixed flexion. Division of the fascia lata therefore removes a deforming force which acts on both joints, as shown in figs. 2 and 3.

Apart from minor local hæmatoma, only 1 of the children treated in this way has suffered postoperative complications. A child of 3 years, known to be suffering from sickle-cell anæmia, had a crisis after operation, but later recovered and became ambulant.

Conclusions and Summary

The operation of multiple subcutaneous division of the fascia lata has enabled 32 African children with hip contractures to walk.

Major surgery in all these cases has been avoided and interference in the routine of a busy general hospital has been slight.

The operation has been only a phase in the management of each patient. Walking instruction, fitting and maintenance of callipers, and home visiting have also been necessary.

It is hoped that a wider application of this method will enable paralysed children to become ambulant in those countries where they have hitherto been considered beyond the scope of surgical aid.

The procedure we have described offers certain theoretical and practical advantages over the more extensive operations at present accepted as the recognised orthopædic treatment for contracture of the hip.

This investigation has been made possible by the enthusiasm and generosity of the Kampala Round Table, whose members have organised and financed the poliomyelitis clinic at Mulago Hospital.

Our thanks are also due to Prof. I. W. J. McAdam for his guidance and advice, to Mr. Peter Cull for the illustrations, and to Mr. Robert Roaf for his permission to describe a method which he originated himself.

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RECURRENT HEPATIC COMA TREATED BY COLECTOMY AND ILEORECTAL ANASTOMOSIS

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THE neuropsychiatric manifestations of liver disease are believed to result from cerebral damage caused by nitrogenous substances formed in the gastrointestinal tract, which normally are removed by the liver and do not enter the general circulation in quantity. Hepatic damage may allow these nitrogenous substances to reach the brain, either by passing through the damaged liver, or by circumventing the liver through portosystemic collateral channels which have developed as a result of portal venous obstruction (Kirk 1936). Portocaval anastomosis, which forms such a shunt, is not infrequently followed by neuropsychiatric disturbance (McDermot and Adams 1954), and Riddell (1955) placed the incidence of this complication as high as 10% after shunt operations.

As the offending substances are formed from ingested protein by bacterial action in the intestine, symptoms are often controlled by restriction of protein in the diet and by antibiotics, such as neomycin, which reduce or modify intestinal bacterial activity. Although usually remarkably effective, this regimen has certain disadvantages; in some patients protein restriction may have to be carried to the point of nutritional impairment, which in turn may lead to hypoproteinæmia with œdema and ascites. Prolonged administration of broad-spectrum antibiotics may cause gastrointestinal disturbance and intercurrent infection with resistant staphylococci or yeasts.

In the case described here these measures failed to prevent recurrent attacks of hepatic coma and led to gradual deterioration of the nutritional state. The problem of reducing intestinal bacterial activity to a minimum was solved by performing colectomy with ileorectal anastomosis, after which no further episodes of stupor or coma occurred and the patient tolerated a normal diet, thus enabling undernutrition to be corrected.

Case-record

A housewife had had recurrent hæmatemeses from the age of 55. After the fifth episode of gastrointestinal bleeding, at the age of 63, she was transferred to Leeds General Infirmary and was noted to have hepatosplenomegaly and a few spider nævi on the face. She had never had jaundice or fluid retention and had always been mentally clear. Portal venography revealed patent splenic and portal veins with extensive gastric and œsophageal varices. Side-to-side portocaval anastomosis was performed by Mr. J. A. Aylwin on Aug. 19, 1954. At operation the liver was noted to be grossly nodular. The patency of the anastomosis was confirmed by portal venography two weeks after operation, and the intrasplenic pressure fell to within normal limits (12 mm. Hg).

Two days after operation the patient suddenly became confused and violent for twenty-four hours. Three weeks later confusion recurred together with irregular coarse tremor of the hands and fœtor hepaticus, followed within twenty-four hours by coma which responded to treatment with aureomycin and intragastric infusion of glucose.

Thereafter recurrent episodes of hepatic stupor and coma occurred; and during the five years following portocaval anastomosis forty such attacks were recorded, necessitating fifteen admissions to hospital; the longest period that the patient remained free from coma was fourteen weeks (fig. 1). In each attack she responded to omission of protein from the diet, large doses of antibiotics (usually neomycin), and evacuation of the contents of the large intestine by enemas. Between these episodes she showed a variable degree of confusion and tremor despite restriction of the protein intake to 40 g. daily and, in the later years, continuous administration of neomycin. As a result of restricted diet her weight gradually declined; by 1959 she had lost more than 40 lb. in weight since portocaval anastomosis (fig. 1) and had developed ankle œdema.

Four times during the early part of 1959 the patient was admitted to hospital in hepatic coma, and on each occasion had been constipated for some days before admission. The response to treatment was noticeably slower than it had been in previous attacks, and apparently this was mainly due to

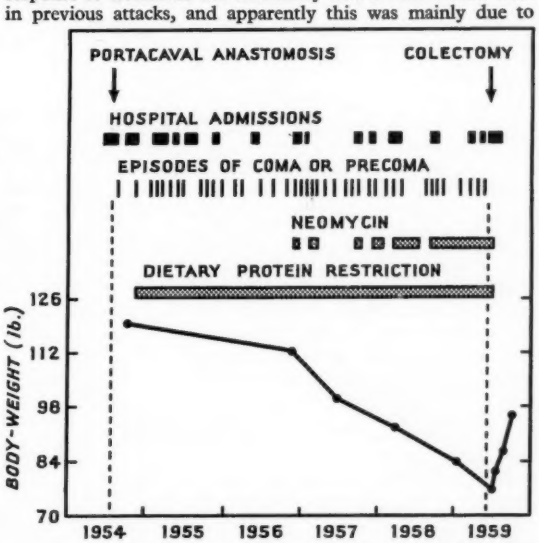

Fig. 1—Effect of colectomy in preventing further attacks of hepatic coma and so permitting the patient to take an unrestricted diet with consequent reversal of downward trend in body-weight.

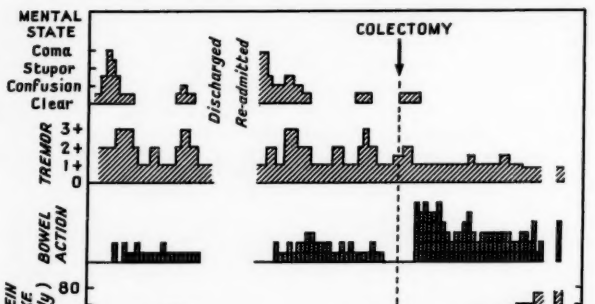

Fig. 2—Effect of colectomy on protein tolerance assessed by changes in mental state and tremor.

Before operation not more than 40 g. of protein daily could be tolerated even when neomycin was taken. After operation protein tolerance exceeded 70 g. daily and neomycin was not required.

difficulty in emptying the bowel. Repeated enemas were required to dislodge the hard fæces from the colon, but once these had been removed her neurological condition improved (fig. 2).

As constipation appeared to play such a prominent part in precipitating hepatic coma and attempts to induce regular bowel habits with aperients and attention to diet had proved persistently ineffectual, it seemed justifiable to resort to surgical measures to correct this state of affairs, particularly as there were no other signs of impairment of liver function.

Colectomy with ileorectal anastomosis was performed on June 24, 1959. Exploration of the abdomen revealed a small fibrotic liver and a normal, rather visceroptosed colon. Total colectomy was carried out, with restoration of intestinal continuity by end-to-end anastomosis between the terminal ileum and the top of the rectum. Recovery after operation was entirely uneventful. Rather brisk diarrhœa in the immediate postoperative period soon gave way to more normal bowel function with about four loose stools daily and none at night. Hepatic coma or stupor have not recurred since colectomy, and the patient has shown progressive improvement in her mental state which is now clearer than at any time in the year preceding operation. Living alone she can manage her house and shopping without help. Neomycin is no longer required and she can take an unrestricted diet. Consequently the downward trend in body-weight has been abruptly reversed and the ankle œdema has disappeared (fig. 1). Fœtor hepaticus disappeared completely after operation and has not recurred.

Some cerebral disturbance has persisted since the operation. Although well oriented in time and place and leading a moderately active life, the patient is emotionally labile and shows an inconstant tremor and dysarthria. Two brief psychological tests, the Mill Hill Vocabulary Scale (1948) and Walton and Black's Modified Word Learning Test (1957) were administered by Mr. R. G. Webster six months after the operation. Her score of 42 on the former places her in grade III minus, indicating an average verbal ability. Her score of 31 plus on the latter test indicates that her capacity for word learning is impaired to a degree compatible with cerebral damage.

Nitrogen Metabolism

Absorption of the products of protein digestion appeared to be unimpaired after colectomy because the fæcal nitrogen excretion was within normal limits (the mean daily value being 0·91 g. over a six-day period).

Balance studies four months after operation, while the patient was on a protein intake of 60 g. daily, showed a positive nitrogen balance.

Protein Tolerance

During the preoperative period the protein tolerance was studied in relation to the neuropsychiatric state. The mental state and tremor were assessed daily by the same observer. During the period of observation regular bowel action was maintained by the use of aperients and neomycin was given. The results are shown in fig. 2, where it will be seen that before operation on two separate occasions neurological deterioration started when the daily protein intake reached 40–50 g. After colectomy the protein intake was gradually increased to the maximum the patient could eat (70 g.), without untoward effect even though neomycin therapy had been discontinued.

Fasting Blood-ammonia Levels

These were determined on peripheral venous blood by the method of Conway (1957). Five months before operation, on a day when the patient was in hepatic coma, the blood-ammonia was 3·0 μg. ammonia-nitrogen per ml. After maximum neurological improvement with medical treatment, the fasting blood-ammonia remained elevated and varied between 1·6 and 2·2 μg. ammonia-nitrogen per ml., the mean level being 1·8.

Five months after operation the fasting blood-ammonia had fallen to normal levels and varied between 0·7 and 1·1 with a mean of 0·9 μg. ammonia-nitrogen per ml. This reduction in blood-ammonia, particularly as it occurred despite cessation of neomycin therapy and return to unrestricted diet after operation, strongly suggested that bacterial catabolic activity in the gut had been greatly reduced by colectomy.

Methionine-tolerance Tests

Methionine, given orally, characteristically exacerbates the neuropsychiatric disturbance in patients with liver disease. This action appears to be due to products formed by the breakdown of methionine by the bacteria of the gut, because it is abolished by preliminary suppression of the intestinal flora with broad-spectrum antibiotics, and parenteral methionine is non-toxic (Phear et al. 1956). In our patient the

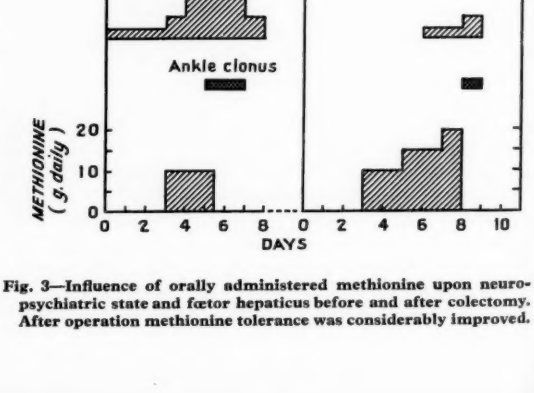

Fig. 3—Influence of orally administered methionine upon neuropsychiatric state and fœtor hepaticus before and after colectomy. After operation methionine tolerance was considerably improved.

liability to develop neurological disturbance after methionine administration was used as an index of intestinal bacterial activity.

Before operation, at a time when symptoms were controlled by rigid dietary protein restriction alone, methionine was given by mouth in a dosage of 2·5 g. four times daily, and a daily examination was made to detect alteration in the neuropsychiatric state. On the third day of methionine administration, when the total dosage reached 25 g., mental confusion returned, tremor increased, and strong fœtor hepaticus developed (fig. 3). These rapidly improved when methionine was discontinued.

Five months after colectomy methionine tolerance was reassessed and was found to have improved greatly. Only after a total dosage of 75 g. did mental confusion occur together with increase in tremor and the appearance of fœtor hepaticus (fig. 3). The improvement in tolerance to oral methionine further confirmed that intestinal bacterial catabolic activity had greatly diminished after the operation.

Ammonium-tolerance Tests

A second and much less likely explanation of the fall in blood-ammonia levels and the improvement in methionine tolerance after operation is that liver-cell function improved about this time. This possibility seemed unlikely because the patient's response to oral ammonium chloride did not change. Before operation, when the neuropsychiatric state was controlled by dietary protein restriction and neomycin therapy, 2 g. of ammonium chloride three times daily caused obvious deterioration with return of mental confusion and increase of tremor on the second day, after a total dosage of 10 g. After operation ammonium chloride was given in a reduced dosage and similar deterioration was apparent on the third day, after a total of 9 g. The patient's ability to deal with ammonia absorbed from the gut was not increased after the operation.

Electroencephalographic Findings

The electroencephalographic pattern found in hepatic precoma or coma was described by Foley et al. (1950), Whitfield and Arnott (1951), and Bickford and Butt (1955). It has been correlated with the degree of neuropyschiatric disturbance (Parsons-Smith et al. 1957); the more severe this disturbance the greater the replacement of the alpha rhythm by slow theta and delta frequencies.

Electroencephalographic recordings were made four years, two years, and one week before colectomy, and two weeks, six weeks, and five months after colectomy. The preoperative records all showed typical changes with a dominant rhythm of 6–7 cycles per second bilaterally synchronous in the parieto-occipital and posterior temporal regions. An underlying alpha rhythm was still discernible. The earlier records were taken at times when the patient was grossly confused and precomatose; yet the record a week before colectomy, although taken after maximal improvement with medical treatment, showed no corresponding improvement in the electroencephalographic pattern.

The records taken after colectomy all showed persistence of the delta and theta frequencies, which were unchanged despite continued clinical improvement. Hence in this patient the electroencephalographic pattern did not appear to correlate with the degree of neuropsychiatric disturbance either before or after operation. Nevertheless, the persistence of such prominent electroencephalographic changes must be taken as confirming the clinical impression that some permanent cerebral damage has been sustained as a result of repeated attacks of hepatic stupor and coma before colectomy.

Discussion

In the early years of this century many clinical disorders were attributed to absorption into the general circulation of toxic substances produced by bacterial activity in the gut. Andrewes in 1913 stated: "The main effect of bacterial activity in the production of alimentary toxæmia lies in their ability to carry out protein cleavages beyond the capacity of the ordinary digestive ferments . . ."; and Dixon (1913) mentioned ammonia and amines as such toxins normally dealt with by the liver. Arbuthnot Lane's (1909) application of colectomy to the treatment of the many diseases he ascribed to alimentary toxæmia resulting from "chronic intestinal stasis" aroused much controversy before this concept was eventually rejected. Amongst his patients was a woman unable to stand or walk and regarded as an imbecile who within a few weeks after colectomy, became happy, active, and intelligent (Lane 1912). The parallelism between this woman's case-history and that of our patient leads to the speculation that she had undiagnosed liver disease and therefore formed a counterpart to the present case.

In more recent years the susceptibility of patients with liver disease to neuropsychiatric disturbance when the dietary protein content is increased has been clearly recognised (Phillips et al. 1952, Sherlock et al. 1954), and the importance of bacterial activity in the gut in the formation of the offending nitrogenous toxins has been re-emphasised. The danger of constipation in precipitating symptoms, and the improvement which results from purgation, have been stressed by Dawson et al. (1957).

We have been unable to find previous reference to surgical treatment for colonic stasis in patients with neuropsychiatric complications of liver disease. Three operations were considered as a means to this end—simple terminal ileostomy, ileostomy combined with total proctocolectomy, and total colectomy with ileosigmoid or ileorectal anastomosis. Though either of the first two procedures might have been thought to offer a more certain prospect of eliminating intestinal stasis, they each had the serious drawback of involving the creation of an artificial anus; and the great attraction of the third operation was that it spared the patient this inconvenience. (This method was eventually favoured by Arbuthnot Lane [1909] in his surgical attack on intestinal stasis.) The occasion to perform colectomy in a patient without colonic disease had never hitherto arisen in our practice, but we had had considerable experience of colectomy and ileorectal anastomosis in the management of familial polyposis and selected cases of ulcerative colitis without rectal involvement. In such patients the operation is followed by mild chronic diarrhœa with normal anal continence, which is compatible with excellent general health and all ordinary activities. This operation was therefore chosen, and in the event has been followed by virtually no incapacity from frequent bowel actions.

Our observations emphasise that the products of protein digestion absorbed in the small intestine are not responsible for the cerebral disturbance in liver disease; after colectomy, despite the increased assimilation of protein, the neurological condition improved, thus clearly delineating the harmless and wholly beneficial process of protein digestion and absorption in the small gut from the potentially noxious one of bacterial degradation of the nitrogen residues reaching the large intestine.

Under normal conditions the bacterial content of the small gut is sparse (Cregan and Hayward 1953); but Martini et al. (1957) reported that in cirrhotic patients the flora of the ileum was increased and contained more coliform organisms and *Streptococcus fæcalis*. Conceivably our patient had an additional increase in ileal flora as a result of colonic stasis, and under these conditions relief of constipation by colectomy might in fact

have reduced the bacterial content of the ileum. The reduction in fasting blood-ammonia levels and the undoubted improvement in methionine tolerance both point to a drastic reduction in intestinal bacterial catabolic activity as a result of colectomy. These findings could not be accounted for by a concomitant improvement in liver function, because the tolerance to administered ammonia remained unchanged after colectomy; and they strongly suggest that the clinical improvement was due to an overall reduction in the bacterial flora of the gut. The ultimate prognosis in this patient may largely depend upon whether, and to what extent, the bacterial population of the small intestine increases in the future.

The favourable results of colectomy in this patient suggest that this operation warrants a more extensive trial in patients with chronic or recurrent neuropsychiatric complications of liver disease. It might be undertaken where medical measures have not controlled or prevented recurrence of symptoms, as in the present case. Progressive undernutrition, resulting from prolonged restriction of dietary protein, might be taken as a second indication for colectomy, which, by increasing protein tolerance increases assimilation and thus improves nutritional status.

Summary

Colectomy with ileorectal anastomosis controlled neuropsychiatric symptoms in a patient with recurrent attacks of hepatic stupor and coma, who five years previously had undergone portocaval anastomosis on account of portal cirrhosis with bleeding from varices.

Protein tolerance was increased; and undernutrition, resulting from dietary protein restriction which had previously been necessary to diminish neuropsychiatric symptoms, was corrected.

We are indebted to Dr. M. J. Parsonage for the electroencephalographic studies; Mr. R. G. Webster, M.A., for psychological assessment of the patient after operation; and Miss Brenda Stannard for assistance with the blood-ammonia estimations.

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"... It is now increasingly realized that a large part of the study of 'handling human relationships' is a generic study, that is, it is the same kind of study for doctors, teachers, social workers, and so on. ... What these professional training courses share ought not to be just a string of helpful academic disciplines, an attempt at making some pious cultural contributions, to ensure that our professional worker is 'well educated'. They ought to be integrated into a coherent course of study which could then represent the highest common factor of general education for all professional courses."—PAUL HALMOS, *The Times*, Feb. 15, 1960.

HEPATIC COMA PRECIPITATED BY CHLOROTHIAZIDE IN HEPATIC CIRRHOSIS WITH ASCITES

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THE development of hepatic coma has been described previously in patients with cirrhosis after administration of nitrogenous substances by mouth (ammonium salts, ammonium cation-exchange resins, urea, methionine, and increased dietary protein.) It has also been reported in patients given drugs such as acetazolamide, barbiturates, opiates, paraldehyde, and tranquillisers. Severe infection, upper-gastrointestinal hæmorrhage, and abdominal paracentesis have also precipitated hepatic coma; and mercurial diuretics are believed to be capable of inducing coma.

Here we report the production of hepatic coma in patients with hepatic cirrhosis and ascites who had been given chlorothiazide, a non-mercurial oral diuretic agent designated chemically as 6-chloro-7-sulphamyl-1,2,4-benzothiadiazine-1,1-dioxide.

Material and Methods

Chlorothiazide, 1 g. was given orally twice a day, at 8 A.M. and 2 P.M., to 12 patients—8 males (7 adults and 1 child) and 4 females (2 adults and 2 children) with cirrhosis complicated by ascites and peripheral œdema. A history of past hepatic precoma characterised by confusion, drowsiness, disturbed consciousness, and flapping tremor was obtained in only 1 instance (table I). The diagnosis of cirrhosis was established by a history of past jaundice (hepatitis) and poor food intake coupled with clinical and biochemical findings. In doubtful cases the diagnosis was confirmed by liver biopsy.

Ascites was graded as follows: severe, tense ascites with cardiorespiratory embarrassment; moderate, tense ascites; and mild, slight ascites.

All patients were given a salt-restricted diet; fluids were not restricted. Urine was measured in twenty-four-hour amounts and saved for analysis. Serum and urine were analysed for sodium and potassium by internal standard flame-photometry. Serum and urine chloride concentrations were determined by silver-nitrate titration technique. Diuretic response to chlorothiazide was assessed as follows: excellent, œdema disappeared and no biochemical abnormalities or toxic effects developed; good, œdema disappeared but toxic effects or biochemical abnormalities developed; poor, œdema failed to clear completely or chlorothiazide was discontinued because of toxic effects or biochemical abnormalities.

Only two stages of hepatic coma were differentiated: impending coma (precoma), characterised by confusion, drowsiness, somnolence, and flapping tremor; and coma, characterised by violence requiring considerable restraint or unconsciousness with response only to painful stimuli or no response at all. The regime of treatment in these patients consisted of: (1) withdrawal of chlorothiazide (precipitating factor); (2) complete elimination of proteins from diet; (3) administration of oral antibiotics (tetracycline 2 g. daily); (4) removal of nitrogenous material in colon by enemas initially, and subsequent administration of magnesium sulphate by mouth; (5) fluid and caloric requirements (at least 1500 calories per day) supplied in the form of concentrated glucose solution given as drinks, by intragastric drip, or intravenously; (6) vitamin (B complex) supplementation; (7) potassium chloride given orally 4 g. daily (caution was exercised especially if the volume of urine was diminished); (8) good nursing care.

TABLE I—CIRRHOTIC PATIENTS TREATED WITH CHLOROTHIAZIDE

Case no.	Age (yr.)	Sex	Past history of jaundice	Degree of ascites	Duration of ascites (mos.)	Previous treatment	Serum-bilirubin (mg. per 100 ml.)	Serum-albumin (g. per 100 ml.)	Past hepatic precoma or coma
1	26	M	+	Severe	3½	Nil	1·8	2·2	–
2	22	M	+	Moderate	1½	,,	0·5	3·1	–
3	25	M	+	,,	3	,,	1·5	2·7	–
4	40	F	+	Mild	1	,,	0·8	3·5	–
5	42	F	+	Severe	2	,,	2·6	2·7	+
6	38	M	–	,,	6	,,	1·2	2·5	–
7	30	M	–	,,	3	,,	2·0	2·2	–
8	35	M	–	,,	9	Mercurials; paracentesis × 5	0·5	2·5	–
9	7	M	–	,,	2	Nil	0·4	4·4	–
10	5	F	–	Moderate	1½	Mercurials	1·1	3·8	–
11	4	F	–	Severe	4	Nil	0·7	2·2	–
12	26	M	–	Moderate	6	,,	0·5	3·2	–

"Recovery" from hepatic coma was defined as improvement sufficient for the patient to leave the hospital, or continued absence of coma or precoma so long as the patient remained in the hospital (average fifteen days).

Results

In 6 of the 12 patients the diuretic response was regarded as excellent (average weight loss 8 lb.), in 2 as good (average weight loss 7·5 lb.), and in 4 as poor (no weight loss). Chlorothiazide caused increased sodium, potassium, chloride, and urine excretion in all subjects; average twenty-four hour values during control and treatment periods are given in table II. Increase in urinary potassium output was associated with a fall in serum-potassium level in every patient except case 9, who received potassium supplements of 2 g. daily concurrently with chlorothiazide. The increase in urinary potassium and the drop in serum-potassium level were usually most rapid and conspicuous in those having the greatest diuresis. In cases 5 and 7, potassium excretion fell below control levels after cessation of drug administration, suggesting potassium depletion. No major change in serum sodium and chloride concentrations was noted (table III). The fall in serum-potassium was associated with a slight fall in serum sodium and chloride values.

Hypokalæmia, defined as a serum-potassium level below 3 mEq. per litre, was noted in 4 patients receiving chlorothiazide without potassium supplements (table III). This state, although sometimes symptomless, is potentially dangerous.

Hepatic Precoma and Coma

This syndrome was noted in 4 of the 12 patients treated (table II). It was usually associated with a good and rapid diuretic response to chlorothiazide.

CASE 5 (fig. 1).—A woman, aged 42 years, with cirrhosis of liver with ascites and jaundice was admitted to hospital with splenomegaly and severe ascites with ankle œdema. There were no neuropsychiatric complications, hepatic fœtor, or flapping tremor, but there was a history of previous hepatic precoma. Chlorothiazide resulted in good diuresis (1800 ml. of urine, compared with 120 ml. in control period) and 2 lb. weight loss in two days. However, within forty-eight hours after starting to take the drug, the patient became drowsy and had slight hepatic fœtor and flapping tremor. The next day (fifty-eight hours after commencing the drug) she became violent, and extremely irritable and passed into a deep coma, regaining consciousness only after thirty-six hours of appropriate therapy.

TABLE III—SERUM-ELECTROLYTES (MEQ. PER LITRE) BEFORE AND FOLLOWING CHLOROTHIAZIDE 2 G. DAILY

Case no.	Before chlorothiazide			At completion of chlorothiazide			Duration of treatment (days)
	Na	K	Cl	Na	K	Cl	
1	135	4·2	100	133	2·7	98	14
2	145	5·0	100	134	4·0	90	6
3	137·5	4·1	110	130	3·8	104	8
4	133	4·7	98	134	4·2	98	4
5	135	4·2	98	126	2·8	95	2
6	130	4·0	96	128	3·8	96	6
7	136	4·8	102	128	2·5	98	2
8	128	4·5	103	128	4·0	102	7
9*	135	3·2	106	130	6·2	104	11
10	125	4·0	105	120	2·2	100	6
11	138	4·2	103	134	3·2	98	10
12	136	4·5	96	134	3·8	95	8

* Potassium chloride 2 g. daily given concurrently with chlorothiazide.

CASE 7 (fig. 2).—This man of 30 years, with cirrhosis with severe ascites and ankle œdema and no past history of jaundice or hepatic coma, responded to chlorothiazide with a good diuresis (1200 ml. of urine compared with 150 ml. in the control period). But within seventy-two hours after starting to take the drug the patient exhibited hepatic fœtor, flapping tremor, and confusion with severe irritability, and in the next twelve hours he became very violent, requiring considerable restraint and passed into deep coma, regaining consciousness only after a hundred and twenty hours of appropriate therapy.

2 other patients (cases 1 and 10) exhibited hepatic precoma while receiving chlorothiazide.

TABLE II—EFFECTS OF CHLOROTHIAZIDE 2 G. DAILY ON URINE VOLUME AND ELECTROLYTES (MEQ. PER TWENTY-FOUR HOURS) AND ON BODY-WEIGHT

Case no.	Before chlorothiazide *				During chlorothiazide †							
	Na	K	Cl	Vol. (ml./24 hr.)	Na	K	Cl	Vol. (ml./24 hr.)	Duration of treatment (days)	Weight loss (lb.)	Diuretic response	Complications
1	6·2	25	53	360	95	117	99	1510	14	10	G	Precoma
2	4·5	23	45	180	84·5	88·5	103	1800	6	8	E	..
3	12	27	43	220	102	98·2	146	1200	8	0	P	..
4	20	37	45	450	75	111·9	85	1500	4	2	E	..
5	3	32	41	120	82	105	95	1800	2	2	P	Coma
6	1·4	10	50	130	90·5	75·5	107·5	1320	6	0	P	..
7	8·2	45	55	150	108	145	117	1200	2	0	P	Coma
8	0·5	16	33	210	58	76	76·5	1800	7	12	E	..
9	1·5	22	29	180	75	..	87	1600	11	9	E	..
10	0·8	19	44	150	55	57	88	1530	6	5	G	Precoma
11	0·2	7·2	15	30	3·4	27·8	45	900	10	7	E	..
12	6·5	27	55	180	137	127	165	2100	8	10	E	..

* Mean of two days. † Mean of first two days. E=excellent. G=good. P=poor.

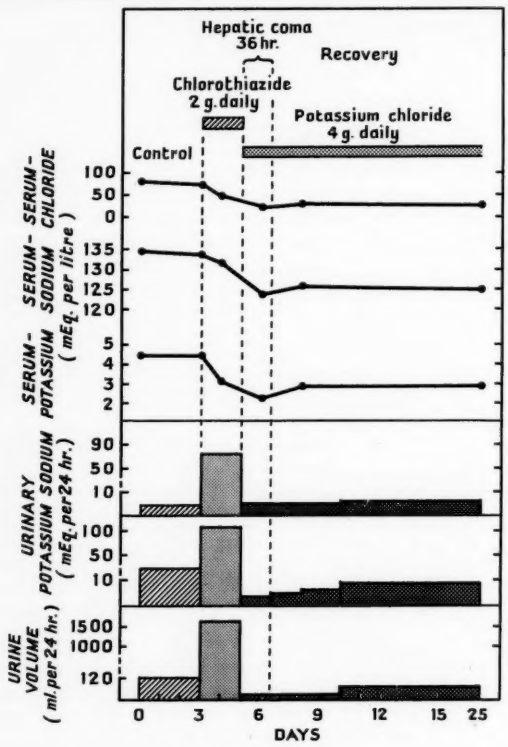

Fig. 1—Findings in case 5.

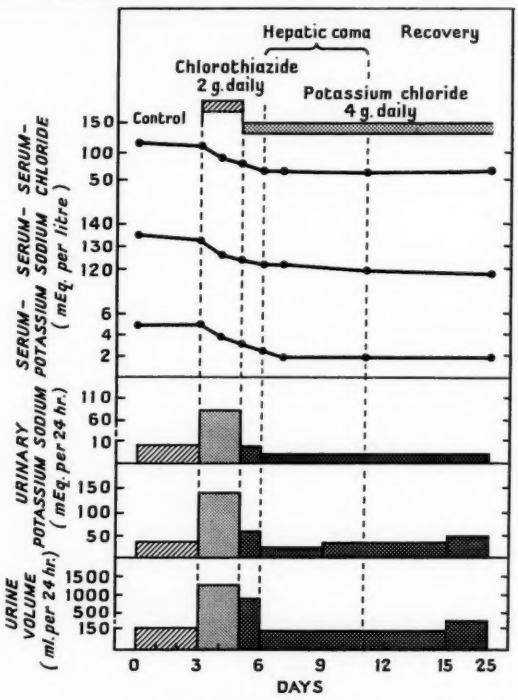

Fig. 2—Findings in case 7.
The hepatic coma lasted for 120 hours.

CASE 1 became drowsy and somnolent with numbness and tingling in the extremities. He was relieved of these symptoms within twenty-four hours by potassium supplements (table IV).

CASE 10 developed drowsiness which cleared up within thirty hours on administration of potassium supplements. Measurements of serum albumin, bilirubin, cephalin-cholesterol flocculation, and thymol turbidity showed no alteration in liver function during and after chlorothiazide administration (table V).

TABLE IV—EFFECTS OF POTASSIUM SUPPLEMENTS ON SERUM-POTASSIUM IN CASES OF PRECOMA AND COMA

Case no.	Duration of treatment (days)	Potassium-supplement (g./24 hr.)	Serum-potassium	
			Before supplement	After supplement
1	4	3	2·7	3·9
5	5	4	2·8	4·0
7	8	2	2·5	3·8
9	6	2	3·2	6·2
10	5	2	2·2	3·5

Discussion

The results show that chlorothiazide can produce hepatic coma in cirrhotic patients with ascites. The exact mechanism is not clear; but hypokalæmia and increased potassium excretion were a constant finding in the 4 present cases. Hypokalæmia developing during administration of chlorothiazide to patients with cirrhosis and ascites has been observed by others. Sherlock et al. (1958) noted the development of hepatic coma during administration of chlorothiazide in 7 out of 13 patients with a previous history of this syndrome; and others have described 1 or 2 cases each. In our series hepatic coma developed in 4 out of 12 cases and only 1 patient had a previous history of this syndrome. It is our impression that the hepatic coma produced in these cases was related to hypokalæmia and potassium deficiency, since administration of potassium chloride caused clinical improvement in the 2 cases of hepatic coma (cases 5 and 7) and prevented further hypokalæmia and hepatic coma in the 2 cases of hepatic precoma (cases 1 and 10).

Conclusions

Chlorothiazide administered to 12 patients with cirrhosis and ascites produced impending or actual hepatic coma in 4. This was associated with increased sodium, potassium, and chloride excretion and a fall in serum-potassium concentration.

Recovery from impending hepatic coma was obtained by oral administration of potassium chloride 4 g. daily.

Chlorothiazide is a useful diuretic agent in patients with

TABLE V—LIVER-FUNCTION TESTS BEFORE AND AFTER CHLOROTHIAZIDE ADMINISTRATION

Case no.	Before chlorothiazide				After chlorothiazide			
	Serum-albumin (g. per 100 ml.)	Serum-bilirubin (mg. per 100 ml.)	Ceph. chol. flocc.	Thymol turb. (units)	Serum-albumin (g. per 100 ml.)	Serum-bilirubin (mg. per 100 ml.)	Ceph. chol. flocc.	Thymol. turb. (units)
1	2·2	1·8	++−−	3	2·2	1·8	++−−	3
5	2·7	2·6	++−−	4	2·7	2·6	++−−	5
7	2·2	2·0	++−−	6	2·2	2·8	+++−	11
10	3·8	1·1	+++−	14	3·8	1·1	+++−	14

cirrhosis and ascites, but patients must be carefully observed for the development of hypokalæmia and hepatic coma.

In our opinion chlorothiazide therapy should not be given to cirrhotic patients outside hospital—particularly patients with a past history of hepatic coma or precoma. Potassium chloride supplements 2–4 g. daily should be given to avoid hypokalæmia, and special caution should be exercised if the volume of urine is diminished.

Unfortunately chlorothiazide therapy is particularly dangerous in the patients with the most satisfactory diuresis.

We wish to thank Dr. K. B. Kunwar and Dr. M. M. Singh for their valuable help and advice in all the phases of this work, and Mr. R. P. Srivastva for his technical help. We are grateful to Merck, Sharp & Dohme for a supply of chlorothiazide, and to Unichem Laboratories, Bombay, for a research scholarship awarded to one of us (S. P. S. T.).

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URINARY OSMOLALITY IN THIRSTING NORMAL SUBJECTS

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DETERMINATION of the specific gravity of the urine after a period of fluid deprivation has been widely used as an indirect indication of the concentrating-power of the kidney. The osmometers now available enable workers to measure renal concentrating-power directly, in terms of osmotically active solute per litre of urine water. With this method it was soon shown that urinary specific gravity is only roughly related to urinary osmolality (Miles et al. 1954, Baldwin et al. 1955, Isaacson 1959). But such studies of renal concentrating-power as now exist, measured in osmolar values, are few, involve small numbers of normal subjects, and have given differing results (Frank et al. 1957, Boyarsky and Smith 1957, Dorhout Mees 1959). Accordingly, I have measured urinary osmolality in 63 apparently normal subjects, after an eighteen-hour period of fluid deprivation, in an attempt to supply definitive figures for this parameter of renal function.

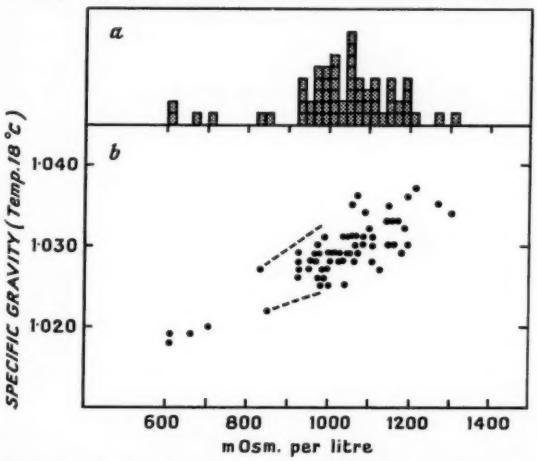

Fig. 1—(*a*) Distribution of urinary osmolality in 63 apparently normal people, after eighteen hours' fluid restriction. Each square represents one person. (*b*) Relations between urinary osmolality and specific gravity in the concentrated urines of (*a*).

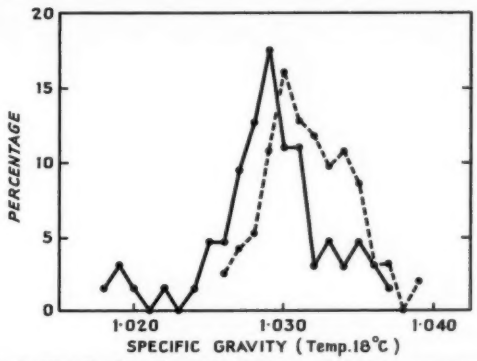

Fig. 2—Distribution of specific gravity expressed as percentage of the number measured. The dotted line represents a comparable series investigated by Addis and Shevky (1922).

63 medical students volunteered for the test. They were asked to abstain from all fluids or liquid foods from 12 NOON, to empty their bladders before going to bed, and to save a specimen of their early-morning urine next day. They were to partake of their usual meals, without liquids, and to carry on with their usual activities. Urinary specific gravity was determined with an ordinary clinical hydrometer, and osmolality with a Fiske osmometer, accurate to 1%. All urine specimens were found to be free from sugar and protein.

The results are shown in fig. 1. 57 (90%) of the students attained urinary osmolalities of over 900 milliosmols per litre. The mean was 1027 mOsm. (S.D. of 110 mOsm.). The range was 610 to 1302 mOsm., 85% falling between 900 and 1200 mOsm.

Different authorities give different levels for the urinary specific gravity which, after varying periods of dehydration, indicates adequate renal concentrating-power (see Fishberg 1954). Fig. 1(*b*) shows that, while a rough correlation exists, the specific gravity may vary by as much as 0·006 for any given osmolality. Urine concentrated to 900 mOsm. per litre must have a specific gravity of at least 1·023, but only with specific gravity above 1·029 can one be sure that the urine has attained this osmolality.

In 1922 Addis and Shevky recorded the range of urinary specific gravity in 75 normal subjects, after twenty-four hours' fluid deprivation. Fig. 2 shows the distribution of specific gravities obtained by me (expressed as percentages of the number measured) compared to that given by Addis and Shevky. My adoption of eighteen hours' rather than twenty-four hours' fluid restriction resulted in slightly lower urinary concentrations. From the known rough correlation between urinary specific gravity and osmolality, and the similarity of the curves in fig. 2, we can infer that the range of osmotic concentration in the series studied by Addis and Shevky must have been very similar to, if somewhat higher than, that found in the present series.

Summary

63 normal medical students were subjected to an eighteen-hour urine-concentration test. Urinary concentrations of over 900 mOsm. per litre were obtained in 90%, with a mean of 1027 mOsm. (S.D. of 110 mOsm.).

Concentrated urines show only a rough correlation between specific gravity and osmolality. Urine of 900 mOsm. per litre must have a specific gravity of at least

1·023, but only at a specific gravity of 1·029 can one be certain that the urine has attained this osmolality.

My thanks are due to Dr. L. Eales, associate professor of medicine in the University of Cape Town, for helpful criticism and advice.

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INTRACELLULAR pH OF POTASSIUM-DEFICIENT VOLUNTARY MUSCLE

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Cooke et al. (1952) found that, during dietary potassium depletion in rats, the potassium leaving the muscle-cells was partially replaced by sodium, about 2 mEq. of sodium passing into the cell for every 3 mEq. of potassium passing out. They postulated that the deficit of cation was corrected by hydrogen ions migrating into the cells, causing an extracellular alkalosis and an intracellular acidosis. Black and Milne (1952) showed that extracellular alkalosis in experimental potassium depletion in man was not associated with increased loss of hydrogen ions from the body, and they suggested that the alkalosis was due to redistribution of hydrogen ions between the extracellular and intracellular spaces.

Migration of hydrogen ions into muscle during potassium depletion should lower the intracellular pH, but actual measurements of the average pH of potassium-depleted muscle have given conflicting results. Gardner et al. (1952) and Schwartz and Wallace (1952) found that intracellular pH was reduced considerably in potassium depletion. Darrow et al. (1953) and Eckel et al. (1959) reported that the pH was not reduced significantly below normal values. All previous workers used a technique dependent on the distribution of free carbon dioxide and bicarbonate between plasma and muscle to which there are several theoretical objections and which is often inaccurate. Waddell and Butler (1959) have introduced a method for determining muscle pH which is apparently more satisfactory; this is based on the distribution of a non-toxic weak acid—5:5-dimethyl-2:4-oxazolidinedione (D.M.O.)—between plasma and muscle. We have used this method to measure the intracellular pH of normal and potassium-depleted rat muscle and to confirm that in potassium deficiency the acidity of muscle-cells increases.

Methods

Potassium depletion was produced in rats by the method described by Evans et al. (1957), except that injections of deoxycortone acetate were not given. A group of twenty-two albino rats, weighing 100–200 g., were used experimentally, and twenty litter mates served as controls. There were two differences between the experimental group and the controls. In the experimental group cation-exchange resin in the sodium phase ('Resonium-A', Bayer) was added to the diet (30 g. resin per kg. of food), whereas the controls were not given resin but potassium salts (50 mEq. per litre) were added to their drinking-water. Plasma and muscle-cell pH was determined when the rats had had the experimental diet for 5–12 weeks.

The method of Waddell and Butler (1959) for measuring muscle-cell pH was slightly modified as follows. D.M.O. 70 mg. per kg. body-weight and heparin 500–1000 units were injected intraperitoneally, and 3–4 hours was allowed for equilibration. The rat was then rendered unconscious by a blow on the head and was bled immediately via a cervical incision, the blood being collected under liquid paraffin without any contact with air. Blood pH was measured at 37°C by a glass electrode. Muscle potassium and chloride were determined in 0·1 g. and 0·5 g. respectively of fat-free dry muscle solid prepared from voluntary muscles of the hind limbs.

Statistical Analysis

Previous workers have regarded normal and potassium-depleted rats as two distinct groups, and have compared mean values from each group. We applied this method of analysis in table I. But in fact the potassium-depleted group was far from uniform, some rats being only mildly depleted of potassium and clinically healthy, others being obviously ill from severe potassium loss.

The degree of deficiency is best measured by determination of the potassium content of muscle fat-free dry solid (F.F.D.S.) and this method of statistical analysis was used in table II and figs. 1 and 2. The levels ranged from a high normal value of 475 μEq. potassium per g. F.F.D.S. to a grossly low value of 225 μEq. potassium per g. F.F.D.S. at the extreme of potassium depletion. Thus plasma pH

TABLE I—STATISTICAL ANALYSIS OF MUSCLE-POTASSIUM, HYDROGEN-ION CONCENTRATION OF PLASMA AND INTRACELLULAR FLUID, AND HYDROGEN-ION GRADIENT IN NORMAL AND POTASSIUM-DEPLETED RATS

Comparison	Mean of normal rats	Mean of potassium-depleted rats	*t* value	P
Muscle-potassium (μEq. per g. F.F.D.S.)	447 (S.D. = 18·1)	298 (S.D. = 38·2)	3·9	<0·001
Hydrogen-ion concentration in intracellular fluid (moles per litre) ..	$11·98 \times 10^{-8}$ (S.D. = $3·58 \times 10^{-8}$) (Mean pH = 6·92)	$20·20 \times 10^{-8}$ (S.D. = $10·36 \times 10^{-8}$) (Mean pH = 6·69)	2·92	<0·01
Hydrogen-ion concentration in extracellular fluid (moles per litre) ..	$4·05 \times 10^{-8}$ (S.D. = $0·195 \times 10^{-8}$) (Mean pH = 7·39)	$3·16 \times 10^{-8}$ (S.D. = $0·216 \times 10^{-8}$) (Mean pH = 7·50)	5·62	<0·001
Hydrogen-ion gradient between intracellular and extracellular fluids (H_i^+/H_e^+)	2·96 (S.D. = 0·89)	6·33 (S.D. = 2·96)	3·8	<0·001

TABLE II—STATISTICAL ANALYSIS OF THE RELATION BETWEEN HYDROGEN-ION CONCENTRATION OF PLASMA OR VOLUNTARY MUSCLE TO THE POTASSIUM CONTENT OF MUSCLE F.F.D.S.

Regression against potassium per g.F.F.D.S.	Gradient of regression line	Significance of difference from zero gradient	Correlation coefficient	Significance of correlation
Extracellular pH	−0·0006	$P<0·001$	−0·82	$P<0·001$
Intracellular pH	0·0013	$P<0·01$	0·54	$P<0·001$
Hydrogen-ion concentration in extracellular fluid	$0·0051\times10^{-8}$	$P<0·001$	0·81	$P<0·001$
Hydrogen-ion concentration in intracellular fluid	$-0·0404\times10^{-8}$	$P<0·025$	−0·35	$P<0·02$
H_i^+/H_e^+	−0·0216	$P<0·001$	−0·62	$P<0·001$
log. H_i^+/H_e^+	−0·00194	$P<0·001$	−0·69	$P<0·001$

and muscle pH can be regarded as continuous variables dependent on the potassium content of the body.

The statistical methods were those described in the monograph by Snedecor (1956).

Results

Table I shows that there was an extracellular alkalosis and an intracellular acidosis in the potassium-deficient rats, the mean plasma pH being 0·11 units above control values, and the mean muscle pH 0·23 units below control. The hydrogen-ion gradient across the muscle-cell membrane was 2·2 times as great in the potassium-depleted as in the normal rats. All these differences are highly significant statistically.

Fig. 1 shows a linear relation when both plasma pH and muscle pH are plotted against the potassium content of muscle F.F.D.S. A more significant correlation is obtained if pH rather than hydrogen-ion concentration is plotted as ordinate, as shown in table II. Since plasma pH rises and intracellular pH falls with increasing severity of potassium depletion, the hydrogen-ion gradient across the muscle-cell membrane becomes progressively greater with increasing potassium loss.

In fig. 2 the hydrogen-ion gradient between intracellular and extracellular fluids expressed logarithmically (log. $[H_i^+/H_e^+]$) is plotted against the potassium content of muscle F.F.D.S. Again a much closer correlation is obtained if the logarithm of the gradient rather than the gradient itself is plotted as ordinate. Table II shows that the gradients of the regression lines and the correlation coefficients are all significantly different from zero at a high degree of statistical probability.

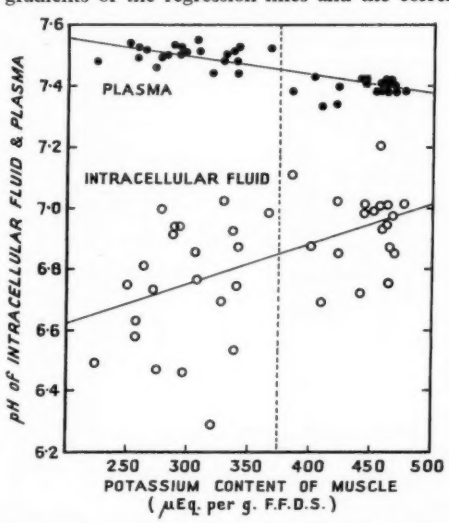

Fig. 1—Relation between pH of intracellular fluid of muscle or plasma and potassium content of voluntary muscle.

The continuous lines are calculated regression lines. Values to the left of the broken line are from potassium-depleted rats; values to the right are from controls.

The theoretical implication of these results will be discussed later in a more detailed paper. This account merely presents the experimental data showing that, as postulated by many previous workers and denied by others, muscle from potassium-depleted rats is significantly more acid than normal muscle.

Summary

A method, involving the distribution of the weak acid 5:5-dimethyl-2:4-oxazolidinedione was used to measure the intracellular pH of normal and potassium-depleted muscle in rats. Potassium depletion caused significant extracellular alkalosis and intracellular acidosis, with an increased gradient of hydrogen ion across the muscle-cell membrane. Better correlation with the degree of depletion was gained by using pH rather than the actual hydrogen-ion concentration, and the logarithm of the hydrogen-ion gradient rather than the hydrogen-ion gradient itself. The mean pH of normal muscle was estimated at 6·92, and of potassium-depleted muscle at 6·69.

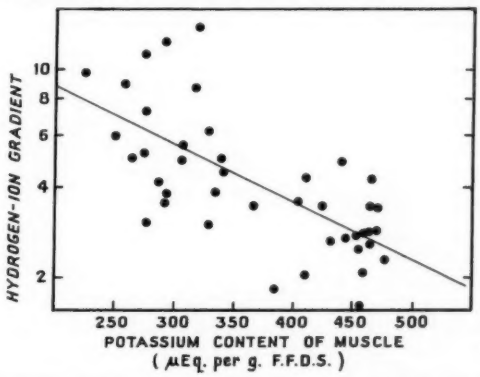

Fig. 2—Relation between the hydrogen-ion gradient across the muscle-cell membrane and the potassium content of voluntary muscle in normal and potassium-depleted rats.

The continuous line is the calculated regression line.

Thanks are expressed to Boots Pure Drug Company, and especially to Dr. J. Warwick Buckler, for synthesis of a pure sample of 5:5-dimethyl-2:4-oxazolidinedione.

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PHARYNGEAL POUCH TREATED BY DIVERTICULO-ŒSOPHAGOSTOMY

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PHARYNGEAL pouches are now usually treated by one-stage excision as advocated by Harrington (1945). When mediastinal infection was a more likely complication than it is today, invagination of the pouch was tried, in order to avoid opening the œsophagus (Bevan 1917); Hill (1917) suggested mobilising the pouch and suturing its distal end higher up the neck, to provide drainage from the sac into the œsophagus. Neither of these two methods was widely adopted. Two-stage excision, which was introduced by Goldmann (1908) and practised by Lahey (1940), was also performed in the hope that the complication of mediastinitis would be avoided. More recently, diathermy excision of the septum between the pouch and the œsophagus, using a special œsophagoscope with a divided end, has been successfully carried out (Harrison 1956). When major surgery is contraindicated, and in the early stages of pouch formation, simple dilatation of the cricopharyngeal sphincter with an œsophagoscope may improve swallowing.

We report a case in which a new operation has been tried for a very large pouch.

Case-report

A man of 57, a hairdresser, presented with a five-year history of regurgitating food after meals; this symptom had become worse over the last year. There was no spill-over into the larynx when he swallowed or at other times, and, although he had lost weight, his appetite was good and he remained at work. He was thin (weight 107 lb.) but there were no physical signs in the chest or neck. Radiological investigations were made, and a barium swallow showed a very large pharyngeal pouch (fig. 1).

Films taken during inspiration and expiration suggested that the pouch was adherent in the right side of the chest; films taken during a Valsalva manœuvre showed pharyngoceles (fig. 2). There was also a congenital abnormality of the cervical spine, which showed fusion of the articular processes and the laminæ of the 5th and 6th vertebræ and narrowing of

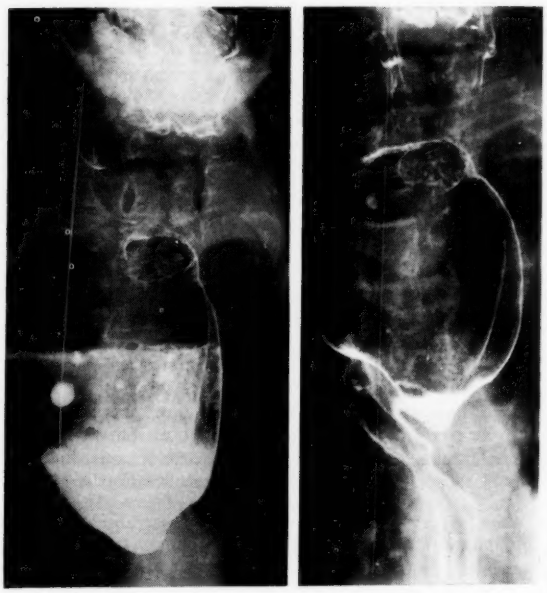

Fig. 2 Fig. 5

Fig. 2—Anteroposterior view showing pouch and pharyngoceles during a Valsalva manœuvre.

Fig. 5—Barium swallow after operation, showing a satisfactorily functioning stoma.

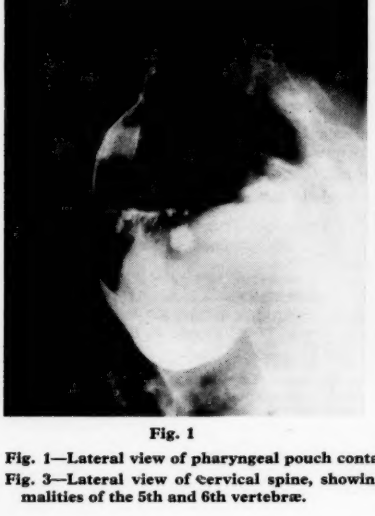

Fig. 1

Fig. 1—Lateral view of pharyngeal pouch containing barium.

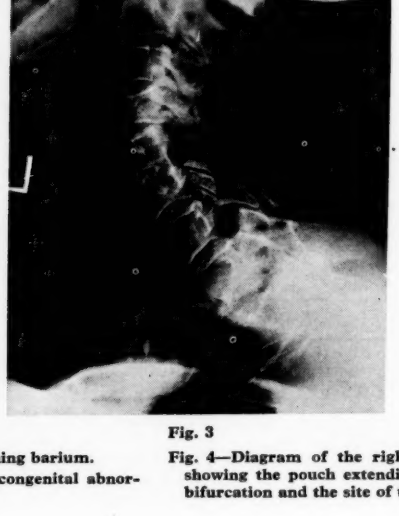

Fig. 3

Fig. 3—Lateral view of cervical spine, showing congenital abnormalities of the 5th and 6th vertebræ.

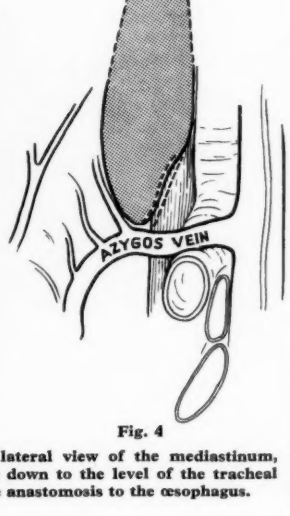

Fig. 4

Fig. 4—Diagram of the right lateral view of the mediastinum, showing the pouch extending down to the level of the tracheal bifurcation and the site of the anastomosis to the œsophagus.

the disc between them (fig. 3). At œsophagoscopy the instrument passed straight into the pouch, which was clean and showed no signs of inflammation. It was possible to move the œsophagoscope about in the upper part of the chest in a remarkable way, and to see the vertebral column bulging into the pouch posteriorly; the opening of the pouch into the œsophagus could not be found.

When treatment came to be considered, it seemed inevitable that excision of the pouch would involve opening the chest and the neck, and though large pouches usually come up into the neck without difficulty, it was feared that this one might be adherent to a large vein. One of us (R. A. W.) therefore suggested that as a simpler alternative the lower end of the pouch should be anastomosed to the œsophagus in the chest. This operation (diverticulo-œsophagostomy) was performed by Mr. T. Holmes Sellors on March 18, 1959.

The chest was opened on the right side, along the upper border of the sixth rib, and after division of the azygos vein the pouch was easily identified; it extended downwards from the neck to the level of the tracheal bifurcation. An opening was made at the lowest point of the pouch (empty except for two green peas), and a vertical incision was made in the œsophagus at the same level. An anastomosis about $1^1/_2$ in. long was then made between the pouch and the œsophagus (fig. 4). A Ryle's tube was passed through the pouch and lower œsophagus into the stomach, and the chest closed with drainage. The postoperative course was uneventful and a fortnight later the patient was swallowing solids well and had gained 10 lb.

Ten weeks after operation he reported that he was eating normally and had gained 27 lb. Another barium swallow showed a satisfactory stoma between the pouch and the œsophagus (fig. 5).

Summary

A large pharyngeal pouch was treated by anastomosis of its distal end to the œsophagus in the chest.

We are grateful to Mr. C. P. Wilson, Mr. R. S. Handley, and Mr. T. Holmes Sellors for permission to publish this case; to Mr. A. Turney for the photographs; and to Miss Hewland for help with the diagram.

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Preliminary Communication

HEART-SPECIFIC AUTOANTIBODIES

SINCE the claims of Masugi [1] and Cavelti,[2] there have been a number of reports of the presence of circulating autoantibodies in cases of heart-disease,[3 4] none of them, however, showing the heart-specificity of the autoantibodies found.[5] Recently, Kaplan indicated the existence of two anti-heart autoantibodies in rheumatic patients, with specificity toward heart tissue.[6] There is some evidence of production of anti-heart antibodies in experimental animals.[7 8]

We report here the production of antibodies to heart-muscle antigen in animals, the activity and specificity of such antibodies, and their presence in sera of human beings with and without heart-disease.

MATERIAL AND METHODS

Immunisation.—A group of mongrel rabbits was given 6 weekly injections subcutaneously of a homogenate of pooled rabbit hearts mixed with Freund's adjuvant.[9] A second group received injections of buffered saline extracts of rat heart with and without adjuvant.

Serology.—Antigens were buffered saline extracts of minced organs. Rabbit sera were examined by a modified Boyden's passive hæmagglutination technique (P.H.),[10] gel precipitation,[11] and complement-fixation tests. Human sera were examined by the P.H. technique, fresh or after storage at −20°C for varying periods.

Pathological effects.—Possible cytopathogenic effects of rabbit sera were examined on 4–5 days old tissue cultures of rabbit or rat heart explants in clot. In addition, histological examinations were made on the various organs of immunised rabbits.

RESULTS

Rabbits Immunised with Rabbit Heart (table I)

In the P.H. test, two out of four rabbits gave high titres (up to 1/2500) with autologous and homologous heart extracts. Lower titres were obtained with extracts of other mammalian hearts (rat, guineapig, dog, and human) and chick heart extracts gave the lowest titres. Extracts of other rabbit organs gave negative results.

Absorption of sera with heart extracts caused reduction in P.H. titre, while absorption with other organ extracts did not.

Preincubation of sera diluted to half the P.H. titre, with heart extracts, caused the inhibition of the P.H. with heart extracts (hæmagglutination inhibition or H.I. test [12]) while extracts of rabbit lung, liver, and kidney did not show this effect.

TABLE I—REACTIONS OF SERA OF RABBITS IMMUNISED AGAINST RABBIT HEART

Extract	Passive hæmagglutination	Gel precipitation	H.I.* with heart-sensitised erythrocytes
Rabbit heart	+	+	+
Other rabbit organs ..	0	+	0
Other mammalian heart	+	+	+

+ signifies positive result or, in last column, positive inhibition.
* Hæmagglutination-inhibition.

Complement-fixation tests showed only an insignificant rise in titre compared with preimmunised sera, while the gel-precipitation method gave positive results, both with heart extracts and with extracts of other rabbit and mammalian organs. The reasons for this remain to be elucidated: there is some evidence that these antibodies are different from the anti-heart antibody detected in the P.H. test.

Rabbits Immunised Against Heterologous Heart Extracts

In addition to anti-rat (species-specific) antibodies shown by all serological techniques used, all four rabbits of this group showed anti-heart (organ-specific) antibodies in their sera as revealed by the P.H. technique. These antibodies reacted with autologous heart extracts as well as with those of other animals. The non-identity of the two groups of antibodies is shown by the results of the H.I. test (table II). Antibodies to rat heart were inhibited by extracts of rat heart but not by extracts of other rat organs or other mammalian heart. Antibodies to "rat" were inhibited by all rat organs tested but not by other mammalian hearts, while "heart" antibodies were inhibited only by heart extracts.

Pathogenic Actions

None of the sera of the immunised rabbits had a cytopathogenic action on rabbit heart cells in tissue culture. However, the sera of rabbits immunised against rat heart extract did have a cytopathogenic action on cultures of rat heart cells.

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TABLE II—HÆMAGGLUTINATION-INHIBITION REACTIONS OF SERA OF RABBITS IMMUNISED AGAINST RAT HEART

Erythrocyte-sensitising extract	Inhibiting extract		
	Rat heart	Other rat organs	Other mammalian heart
Rat heart	+	0	0
Other rat organs	+	+	0
Other mammalian heart ..	+	0	+

+ signifies inhibition of hæmagglutination.

No pathological lesions were found in the hearts of rabbits immunised with homologous heart extract, although some showed circulating anti-heart autoantibodies.

The rabbits immunised with the aid of adjuvant showed the focal infiltrations in lungs, liver, and brain ascribable to the adjuvant.[13]

Three Groups of Human Sera

1. *A case of post-myocardial-infarction syndrome.*—This is the Israel case referred to by Dressler.[14] The serum had been stored at −20°C for 4 years. In the P.H. test with human heart extract, there was a strong positive reaction up to a dilution of 1/160 and a titre of 1/80 with extracts of other mammalian hearts (dog, guineapig, rat, and rabbit). Extracts of human and rabbit kidney gave negative results in this test. The specificity of these antibodies for heart was shown in the H.I. test (table III)—i.e., they were inhibited by extracts of mammalian heart but not by extracts of other organs.

A second serum sample, taken after 4 years' freedom from attacks, was negative.

2. *Adults in hospital with heart-disease.*—These sera were examined fresh, against extracts of human and dog heart and human kidney.

Three out of four cases of recent myocardial infarction and all of five cases of acute rheumatic activity (on a chronic background) gave positive results. Of eight patients with myocardial insufficiency, anginal syndrome, and the like, five were positive.

Only one of five cases of inactive rheumatic or congenital heart-disease was positive when examined immediately before or after cardiotomy. This patient had had recurrent congestive heart-failure for some years.

As a control, fifteen sera sent to the clinical laboratory for a variety of tests (e.g., rhesus group in pregnancy) were examined. Two of these gave a positive P.H. test.

All the positive sera reacted with both human and dog heart extracts. Some of them reacted, too, with kidney extracts. As in no case the titre was higher than 1/10, further characterisation of antibody specificity was not possible.

3. *Children with non-active rheumatic heart-disease.*—The sera had been taken up to 2 years previously from children in a communal settlement with a high prevalence of rheumatic heart-disease. All the children had received continuous chemoprophylaxis and none had detectable albuminuria. Nine out of twelve gave positive reactions similar to those described in the adults (group 2).

Of fourteen sera from apparently healthy children from the same settlement, four gave positive P.H. tests.

COMMENTS

It is hard to conceive of an autoimmune reaction that is not linked to a specific antigen, such as is involved in diseases of lens,[15] testis,[16] brain,[17] and thyroid.[18] Among the few investigators successful in demonstrating autoantibodies in heart-disease, only Kaplan has shown their organ specificity.[6 7] In his case, however, the antigen was particulate and insoluble in saline, unlike those described here.

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TABLE III—HÆMAGGLUTINATION-INHIBITION REACTIONS IN CASE OF POST-MYOCARDIAL-INFARCTION SYNDROME

Erythrocyte-sensitising extract	Inhibiting extract		
	Human heart	Human and Rabbit kidney	Other mammalian heart
Human heart	+	0	±
Dog heart	+	0	+

+ signifies complete, ± partial, inhibition of hæmagglutination.

The concept [19] of autoantibodies as a cause of disease is not supported by our finding circulating anti-heart antibodies in rabbits without any pathological change in the heart. Probably these autoantibodies are a consequence rather than a cause of tissue destruction. The pathogenic autoimmune reaction may be due to the action of cell-bound antibodies [20] or "forbidden clones" as suggested by Burnet.[21] Be that as it may, the presence of circulating organ antibodies may be assumed to indicate autoimmune disease.

A striking finding in the present experiments was the similarity in the anti-heart antibodies produced by immunised rabbits and by the patient with post-myocardial-infarction syndrome. This seems to support Dressler's suggestion [14] that the syndrome is due to an autoimmune reaction, though the initiating stimulus here is different from that in the experimental animals.

The low hæmagglutinating titres found in other positive human sera prevented characterisation of the antibodies, but they may be identical with those described by Dornbusch.[4] Absence or low titre of antibody may be attributed either to adsorption of antibody on heart tissue or to inability to react to this specific antigen.

Thanks are due to Prof. A. Laufer for the histological examinations and to Dr. D. Nelken for his helpful advice. The experimental work in this communication forms part of the subject of the PH.D. thesis of one of us (I. G.).

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ADDENDUM

We have since found three further cases with high titres of specific heart autoantibodies similar to those found in the case of post-myocardial-infarction syndrome. Two of the cases suffered recent myocardial infarction and the third had recently undergone mitral valvotomy.

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"... Among the professions, your best opportunity, money-wise, is to be a doctor. In fact when it comes to money, it is better to be an independent physician than just almost anybody. General practitioners on the average net around $16,000 a year, surgeons average about $35,000. (Psychiatrists average only $17,000, perhaps because their patients individually take up more of their time than ordinary patients.) Most specialists average several thousand more. . . . Why have medical practitioners succeeded in pulling so far ahead of other professionals? A scarcity—an artificial one, some charge—has been created. . . . In 1900, there was one licensed doctor for every 578 people. By 1940 the proportion of doctors had shrunk to the point where there was one for every 750 patients, or, if you consider only those still in active practice, there was one active doctor for every 935 persons."—VANCE PACKARD, *The Status Seekers*; p. 99. London, 1960.

Reviews of Books

Essential Principles of Pathology

JOHN W. LANDELLS, M.B., M.R.C.P., reader in pathology in the University of London at The London Hospital. London: Pitman Medical Publishing Co. 1959. Pp. 278. 25*s*.

SOME will be tempted to dismiss this as a cram book, but they would be very wrong; for though it is cheap and could serve as efficiently as any cram book it is in fact an honest and well-thought-out attempt to produce a real introduction to pathology at a level which enables the slower undergraduate to read with profit. Too often "introductions" to pathology deal almost exclusively with principles, disregarding the fact that basic principles can be terribly hard things to grasp *first*, and that in subjects like pathology it is often best to build foundations after the ground floor. Judging fairly accurately the capacity of the average student, Dr. Landells has not included all the things he thinks ought to be learnt, but as many as he thinks will in practice be learnt.

Standard textbooks of pathology have been written by men who in their time were outstandingly intelligent undergraduates, and, good though some of the available examples are, many textbooks seem to be concerned less with helping the student with pathology as a subject he meets in his course and more with serving him as a reference text for the rest of his life. They aim to be accurate, judicious, and, above all, to leave nothing out: too often it is the criticism of fellow pathologists that the author fears, rather than that of more junior readers. For the bright student who is best on a tough diet, they are excellent; but they are heavy going for the average, and often nearly unintelligible to the tail end. Dr. Landells seems to be attempting to reproduce the kind of teaching, simplified when it can be honestly simplified, that a conscientious teacher well in touch with his audience tries to give when early flourishes are over and examinations loom. His 270 uncrowded pages cover most of what can be expected: certainly few examiners could fail a student who was thoroughly familiar with this book. One difficulty is that no two pathologists would agree as to what are the *essential* facts of pathology; and in an attempt to retain the immediacy of verbal teaching Dr. Landells occasionally lapses into sentences that will irritate some readers. A few of his classificatory passages are of questionable logic. But this is a book that sets itself a worthwhile though smallish target, and hits it fairly. Undergraduates who have no hankering after distinctions should welcome it.

Antibiotic Therapy for Staphylococcal Diseases

Editors: HENRY WELCH, PH.D., editor of *Antibiotics and Chemotherapy*, Washington, D.C.; MAXWELL FINLAND, M.D., associate professor of medicine, Harvard Medical School. New York: Medical Encyclopedia, Inc. London: Interscience Publishers. 1959. Pp. 208. 34*s*.

ANTIBIOTIC-RESISTANT staphylococcal infections have now reached formidable proportions; they complicate operations, contaminate hospital nurseries, and exalt the virulence of influenza epidemics. Staphylococci spread on the skin, persist in the nose, and circulate in the blood, whence they may settle with disastrous effect in brain and bone. Their disregard of antibiotics has placed all those concerned, from pædiatrician to geriatrician, in a position of growing anxiety against mounting morbidity and mortality. Various steps to reduce the hazard include vigilance against cross-infection, combinations of antibiotics, rotation of drugs, measures to improve host resistance, and, fortunately, some new antistaphylococcal agents.

This authoritative monograph gives a critical account of the problem and evaluates the six latest antibiotics to join the fray—erythromycin, oleandomycin, novobiocin, vancomycin, ristocetin, and kanamycin. The six chapters describing them are the most modern and comprehensive accounts available. In an opening chapter, Dr. Welch outlines the development of the staphylococcal menace and the impact of earlier antibiotics upon it. And finally Dr. Maxwell Finland compares the relative value of the various antistaphylococcal drugs and provides a perspective for those who are bewildered as well as bedevilled by the staphylococcus.

Statistical Methods in Biology

NORMAN T. J. BAILEY, D.SC., reader in biometry, University of Oxford. London: English Universities Press. 1959. Pp. 200. 25*s*.

THIS short book provides a clear account of the principles underlying the standard statistical methods and the steps required for the calculations. Using a minimum of mathematics, Dr. Bailey illustrates the techniques with examples from various fields of biology and medicine. The topics covered are orthodox (occasionally, even, old-fashioned), but two valuable innovations are introduced. There is an excellent chapter on computing and on the use of desk calculating machines; and a final section of the book, on green paper, contains a glossary, some necessary tables, and a 26-page summary of the methods described earlier. This is one of the best books of its type.

Recent Advances in Public Health

2nd ed. J. L. BURN, M.D., D.HYG., D.P.H., medical officer of health, City of Salford. London: J. & A. Churchill. 1959. Pp. 370. 40*s*.

THIS book has been entirely rewritten, and it is misleading to call it a second edition, twelve years after the first, when its function is to tell about recent advances. It does so in a very pleasant style, and, in addition to the usual references, there are suggestions about books and published papers for further reading, and a most useful list of voluntary organisations willing to help. Dr. Burn has intentionally restricted the scope of his book to give a more detailed account of the advances on a narrower front, the practical day-to-day working of some of the public-health services at local level in Britain. The balance between the individual, the community, and the environment has come down heavily with emphasis upon the personal services, personal relationships, and clinical involvement. No doubt that truly reflects the preoccupations of the National Health Service in its first ten years. Some of the advances have taken the public-health services deep into the therapeutic spheres of the hospitals and general practitioners, usually by that happy multiprofessional cooperation which runs as a theme of hope throughout the book. It may be hard for the public-health service to find the time, or be able, to untangle itself to meet the wider challenge of modifying man's environment to meet the needs of man. Ionising radiations just throw their shadow across only a corner of the text.

This is a book for the public-health practitioner rather than the student, as any evaluation of advance must be. It demands some established experience to keep the sophisticated minutiæ of British personal services in perspective with the greater epidemiological and environmental changes in the world today, and to see that there is ample scope for advance on a broader front, with perhaps good hope of a breakthrough before the next edition. Dr. Burn concludes with a timely reminder that the promotion of health is a bigger concept than the mere prevention of disease. There is a lot in this book to turn to for refreshment and to think about.

The Archetypes and the Collective Unconscious

C. G. JUNG. The collected works: vol. 9, part 1. Editors: Sir HERBERT READ, MICHAEL FORDHAM, M.D., GERHARD ADLER, PH.D. Translated by R. F. C. HULL. London: Routledge & Kegan Paul. 1959. Pp. 462. 52*s*. 6*d*.

THIS large and beautifully produced volume is rich in format and in content, and brings together writings of Professor Jung formerly published in journals and books. The text consists of six sections: the first includes papers on archetypes of the collective unconscious and the concept of the collective unconscious; section 2 deals with psychological aspects of the mother archetype; section 3 is concerned with rebirth; section 4 with the psychology of the child archetype and the psychological aspects of the Kore; section 5 is on the phenomenology of the spirit in fairy tales and the psychology of the trickster-figure; and section 6 contains chapters on

conscious, unconscious, and individuation, and a study in the process of individuation. There are 80 plates, 29 in colour, and 5 figures.

Anyone familiar with Jung's ideas will be delighted with this book, while to the sceptic or the novice the chapter in section 1, on the concept of the collective unconscious, may be recommended as an introduction (appropriately enough, it is the text of a lecture given to the Abernethian Society at St. Bartholomew's Hospital).

The Golden Age of Quackery

STEWART H. HOLBROOK. London and New York: The Macmillan Company of New York. 1959. Pp. 302. 34*s.* 6*d.*

EIGHTY years ago the United States was expanding at a rate greater than that of any nation in the history of the world. Its population was increasing by more than a million a year, and, numerically and geographically, much of that population had outstripped its supply of doctors. Many of its inhabitants were comparatively wealthy, but ill educated. (In 1870, the head of Harvard Medical School was reported as saying that "written examinations could not be given because most of the students could not write well enough".) This was the *Golden Age of Quackery* of Mr. Holbrook's title, the heyday of the patent-medicine maker.

Unhampered by any licensing or narcotic laws it was possible at this time for unscrupulous manufacturers to sell "tonics" which derived most of their effect from being 50% alcohol; to compound "cures for the liquor habit" which owed their efficacy to a heavy dose of morphia; and to brew "cough syrups", each bottle of which contained a lethal dose of opium. Stimulated by widespread and sustained advertising, the demand for such preparations could be raised to the point when it was difficult (even, in one case, for an organisation employing a thousand people) to meet it. Nor was the market for these medicines restricted to the ignorant or the unlettered. In 1861 the commissariat of the Union Army bought Hostetter's Bitters, the "Anti-Bilious Alterative" by the car-load. The most notable feature of this nostrum was its 47% alcohol content, and a Civil War historian was later to write that "its vaunted remedial properties were sadly lacking: but many a frightened Yankee at Gettysburg knew he faced Pickett's Charge as bravely as he did because of the swig of Hostetter's under his belt".

This book, by a distinguished authority on several aspects of American life at this time, gives an unusual and amusing account of these bogus remedies, of the picturesque medicine shows, the anatomical museums, and a host of devices calculated to assist in the task of parting the gullible from their money. The Golden Age ended abruptly on Jan. 1, 1907, when the Federal Pure Food and Drug Act became law. And let any reader on this side of the Atlantic, who is inclined to smile at the credulity of his American cousins, reflect that comparable legislation in this country was delayed until 1941.

Tools of Biological Research (Oxford: Blackwell Scientific Publications. 1959. Pp. 183. 37*s.* 6*d.*).—Edited by Mr. H. J. B. Atkins, this book records the proceedings of the successful symposium held at Guy's Hospital in October, 1958.[1]

1. See *Lancet*, 1958, ii, 856.

New Inventions

A TREPHINE NEEDLE FOR VERTEBRAL BODY BIOPSY

A MODIFIED trephine needle has been devised to overcome the defects of the method of aspiration biopsy described by Valls et al.[1] With this method only small quantities of material can be obtained for examination, and in sclerotic lesions the needle cannot penetrate the cortex of the bone.

With the new instrument larger samples can be taken from any type of vertebral lesion without injury to the patient.

The needle has four parts (fig. 1):

The needle holder (A) is a steel rule, boldly marked in centimetres, with a needle holder at one end fixed at an angle of 55° to the horizontal. A sliding pointer makes it possible to adjust the distance from the mid-line at which the needle enters.

The biopsy needle (B) is 16 cm. in length and 3 mm. in diameter and is marked in centimetres. It has sharp cutting teeth at the distal end, and a milled circular head to facilitate gripping when the cortex of the bone is trephined.

The exploring needle (C), which is 17 cm. in length and 2 mm. in diameter, is headless to permit the biopsy needle to slide over it when correctly placed.

The infiltrating needle (D), which fits within the exploring needle, is used for infiltrating with local anæsthetic as the exploring needle is advanced. It is withdrawn before the biopsy needle is inserted over the exploring needle.

The position of the needle for biopsy is determined from a previous X-ray examination in which a steel rule has been included to allow for distortion. The important factor is the point of entry, which must be some distance from the midline to avoid the transverse processes. It may be calculated as suggested by Ray[2]: the depth of the vertebral body is measured on the plate, and, as the needle is fixed at a known angle, the other measurements can be calculated trigonometrically (fig. 2).

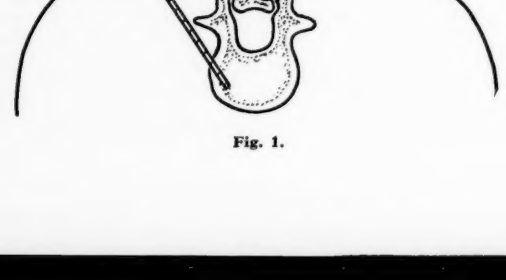

Fig. 1.

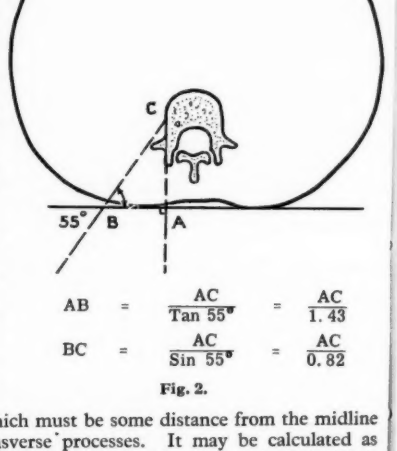

Fig. 2.

In practice, a piece of bone measuring 1 cm. × 2 mm. is obtained without difficulty: this is large enough to show the trabecular pattern as well as to permit a wide field for examination of the cellular structure.

This needle and several prototypes have been developed with the assistance of Mr. J. G. Edwards, of the Edwards Surgical Company, 289, City Road, London, E.C.1, and various members of the staff of the Orpington and Farnborough Hospitals, Kent, to whom I am greatly indebted.

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1. Valls, J., Ottolenghi, C. E., Schajowicz, F. *J. Amer. med. Ass.* 1948, **136**, 376.

2. Ray, R. D. *J. Bone Jt Surg.* 1953, **35A**, 760.

THE LANCET
LONDON 27 FEBRUARY 1960

The Unclaimed

OF the world's two and a half million unsettled refugees about a hundred thousand are on our doorstep, in Europe. Some have been Stateless sojourners for fifteen years, leading a half-life without home or work or hope; and a new generation is growing up which has known no other way. Many organisations and workers are striving to end their plight; and, if what they have done falls short of the need, it is largely because they have been denied the means of doing more. This is not necessarily due to imperviousness: the opening of doors to Hungarians who left their country in 1956 showed that, when the imagination is fired, people will respond; and the success in some countries of appeals in the World Refugee Year betokens growing uneasiness about those who remain in temporary refuge.

One fact is clear: the four European countries which have unsettled refugees in large numbers—Greece, Italy, Austria, and Germany—cannot provide satisfactorily for all of them. Ungrudgingly these countries continue to give asylum to new refugees whose status under the United Nations mandate is established. Italy, far from rich, with 2 million unemployed or underemployed and with some 400,000 of her own citizens from overseas accommodated in camps, yet shelters and feeds 5000 unsettled refugees and accepts new ones as they cross the border. About 90% of these emigrate; but 10% remain and are an added charge on the country's resources. If Italy and her neighbours are prepared to grant asylum, so should others be: the responsibility is international.

This international responsibility cannot be fulfilled so long as the present immigration laws are retained. Designed to protect native populations, these laws are archaic, futile, and harsh. Their archaicism is evident from their insistence on freedom from signs of pulmonary tuberculosis. Their futility is reflected in the experience of the Hungarian exodus, when thousands were allowed to cross borders with scant regard to security or medical checks: no country seems to have been endangered or put to great expense. Their harshness is shown by acceptance under them of the young and the fit while their less able relatives are excluded. Such negative selection is not only inhumane but also unfair: it is inhumane because it tends to split families, and it is unfair because it leaves the handicapped to the care of the overburdened first country of asylum. An early objective should be to secure that would-be immigrants are not considered as individual units, and that no family is barred from immigration simply because it has one or more disabled members: after all, no family need cost the second country of asylum anything if a breadwinner can support his relatives. One or two countries, recognising this, have already gone some way towards amending their immigration laws.

Relaxation of these laws will not by itself enable all the "hard core"—those who have been rejected for immigration under mass schemes—to settle in a second country. But we should free our minds of any idea that these people will necessarily be a burden on the community: impaired vision in one eye, loss of a kidney, an untreated hernia, a healed tuberculous lesion, a stiff knee—these barriers to immigration under mass schemes do not prevent useful work. On the other hand, the "hard core" also includes some—such as "unaccompanied" mothers with children—who will less certainly be self-supporting. In the survey which appears on p. 481 of this issue we suggest that priority should be given to these, to the tuberculous, and to the ageing and elderly—those over 45, unacceptable under mass schemes, who are not always fit for the heavy work which is all that can be offered in some of the first countries of asylum. But the aim, with other countries, should be no less than the acceptance of all refugees who wish to leave the Continent. And common sense tells us that this task should be undertaken at once; for an employable person who is unemployed—as many at present are—is a needless charge on the community, and the longer he remains unemployed the harder will he find it to resume work.

Europe's "refugee problem" can be solved and solved quickly, but only if more money is forthcoming and if nations deliberately accept more of the handicapped. The Office of the United Nations High Commissioner for Refugees has been making good use of relatively small sums subscribed by individual Governments, both for resettlement and for integration. Of our own voluntary bodies, the non-denominational Adoption Committee for Aid to Displaced Persons is noteworthy as the first organisation to have applied substantial sums to the resettlement of those in unofficial German camps—who, as a group, are perhaps in greater need than any other. In our review we suggest that on the Continent refugees might be better served if the dozen or so main voluntary agencies worked in closer union. The same may be true of voluntary bodies in this country. If in this World Refugee Year the many British organisations had launched a united appeal instead of raising funds on their own behalf and at the same time participating in the appeal by the central committee, the impact would undoubtedly have been greater. Is it too late to take a leaf from the copybook of Norway, which has a single refugee organisation? With its small population of $3\frac{1}{2}$ million, Norway has an unparalleled record for accepting handicapped refugees; and in this World Refugee Year £520,000 was raised in the first drive. So far the per-caput contribution is highest in Norway, where it amounts to nearly 4*s*. Norway is followed by Sweden, the Netherlands, and New Zealand. The United Kingdom comes fifth, with about $10\frac{1}{2}d$. per head: our original goal of £2 million has lately been reached, and the goal has now been set at £4 million.

We look back on the Victorian era as one of contrast between riches and slum poverty. We should not let our grandchildren recall mid-20th-century Europe as a place of general prosperity with small islands of destitute Stateless people whom no nation claimed. If this is to be avoided the flame which burned briefly in 1956 must be rekindled and kept alight: the acceptance of Hungarians in that year (though the motives may not always have been purely humanitarian) is the one example of almost unreserved international effort. Settling Europe's refugees will give us heart and confidence for the vaster issue of the two million in the Middle East and Far East. In this endeavour let us be informed by EDMUND BURKE: "It is not, what a lawyer tells me I *may* do; but what humanity, reason, and justice, tell me I ought to do."

[*Contributions may be sent to the United Kingdom World Refugee Year Committee, 9, Grosvenor Crescent, London, S.W.1.*]

Peptic Ulcer in Town and Country

METHODS of estimating the frequency of peptic ulcer all have serious limitations, and the overall and regional prevalence of this common condition remains unknown. Mortality, clinical, and necropsy statistics are almost always made within selected hospital populations, and varying standards of examination and diagnostic criteria reduce their value. Population surveys, though expensive and time-consuming, probably provide the best basis for estimation, but they are limited by the fact that the criteria for the diagnosis of ulcer are by no means precise. Notable in the field of population surveys of ulcer frequency has been the work of C. N. PULVERTAFT [1] in York. As a sequel to the pioneer work done in that city by VISICK [2] on the surgery of peptic ulcer, PULVERTAFT, with the help of medical and surgical colleagues, has managed to collect all new peptic ulcers developing in the city of York and in the surrounding country districts of Easingwold, Flaxton, and Pocklington in the five years 1952–57. As the size of the total population at risk was known it was possible, probably for the first time, to estimate ulcer frequencies accurately in an unselected population—105,371 in the city of York and in 33,335 people in the country area. Particularly stringent diagnostic criteria were observed throughout: ulcers were judged to be present when they caused acute perforation or hæmorrhage, when they were found at necropsy, gastroscopy, or operation, or where they were convincingly demonstrated radiologically.

In the five years 1132 ulcers were found, 823 in men and 309 in women. Diagnosis rested, in both sexes, on clinical grounds in 3 out of 4 patients and on hæmatemesis in 1 in 6. The proportion of women with acute perforation (7·8%) was appreciably less than in men (13·7%), possibly because duodenal ulcers, which perforated more often, were relatively less common in women. Of the 823 ulcers demonstrated in men, 658 were duodenal, 126 gastric, and 31 antral; and 8 had combined gastric and duodenal ulcers. Of the 309 ulcers in women, 204 were duodenal, 89 gastric, and 11 antral; and 5 had ulcers in both sites. The mean annual incidence per 1000 population aged 15 years and over was, for duodenal ulcer, 2·15 in men and 0·62 in women, and, for gastric ulcer, 0·53 in men and 0·31 in women.

Age had an important bearing on incidence. There seemed in men to be an equal liability for duodenal ulcer to develop at any age between 25 and 64; and the risk was appreciably less under 25 or over 65. Gastric ulcers, in contrast, developed more often in men between the ages of 45 and 64. Women began to have symptoms from duodenal ulceration most commonly between 35 and 44, and ulcer frequencies remained high in postmenopausal and elderly women. Gastric ulcers increased in frequency in women with advancing years, occurring most commonly in the elderly and middle-aged. The increased frequency of ulcer and ulcer complications at the time of the menopause was emphasised by CLARK.[3] The overall age-incidence of ulcer in both sexes was remarkably similar to that in the necropsy data of WATKINSON.[4 5]

The influence of social class on the incidence of gastric ulcer had previously been demonstrated by MORRIS and TITMUSS [6] and by DOLL and others,[7] both groups being unable to show any similar relation for duodenal ulcer. In the York survey the occurrence of both types of ulcer seemed to be influenced by social and occupational factors. Thus, duodenal ulcer in men increased from 2·08 per 1000 in professional and semi-professional classes, to 2·26 in artisans, and to 3·13 in semiskilled and unskilled workers. Differences were even more striking in gastric ulcer, which increased in these groups from 0·34 per 1000 in professional and semiprofessional classes to 0·92 per 1000 in unskilled or semiskilled artisans. The decreased liability of agricultural workers to ulcer, reported by DOLL et al.,[7] was not confirmed in the country district around York.

Striking geographical differences in the frequency of peptic ulcer have been reported in several countries. DOGRA [8] found that ulcer arose more commonly in Southern than in Northern India; and KONSTAM [9] reported more ulcers in Southern than in Northern Nigeria. In Europe similar regional differences were reported from Sweden,[10] Italy,[11] and Denmark.[12] In England in 1944, MORRIS and TITMUSS [6] demonstrated lower mortality-rates from ulcer in rural than in urban communities. WATKINSON,[4] by a forward-planned necropsy survey undertaken at selected hospitals in England and Scotland in 1956, found that duodenal ulcer was significantly more common and caused more deaths in northern than in southern cities—a difference more striking in men than in women, and for duodenal than for gastric ulcer.

Despite the difficulties of comparing clinical estimates of ulcer frequency with material collected in other ways, PULVERTAFT [1] felt able to draw a few limited analogies

1. Pulvertaft, C. N. *Brit. J. prev. Soc. Med.* 1959, **13**, 131.
2. Visick, A. H. *Lancet*, 1948, i, 505, 551.
3. Clark, D. *Brit. med. J.* 1953, i, 1254.
4. Watkinson, G. *Schweiz. Z. allg. Path.* 1958, **21**, 405.
5. Watkinson, G. *Gut* (in the press).
6. Morris, J. N., Titmuss, R. M. *Lancet*, 1944, ii, 841.
7. Doll, R., Jones, F. A., Buckatzsch, M. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1951, no. 276.
8. Dogra, J. R. *Indian J. med. Res.* 1940, **28**, 145.
9. Konstam, P. G. *Lancet*, 1954, ii, 1039.
10. Bager, B. *Acta chir. scand.* 1929, **64**, suppl. 11.
11. Ginnanneschi, G. *Med. d Lavoro*, 1938, **29**, 65.
12. Alsted, G. Peptic Ulcer in Denmark. Copenhagen, 1953. See *Lancet*, 1953, ii, 444.

to illustrate that regional differences might appear. Thus, the frequency of acute perforation in duodenal ulcer in men in York appeared appreciably higher than in Glasgow [13] and Aberdeen [14] but no similar trend was noted in women. Gastric ulcers perforated more commonly in York in both sexes. When comparing his clinical ulcer frequency with the necropsy material collected by WATKINSON [5] in Leeds between 1930 and 1949, PULVERTAFT used for comparison the frequency of chronic active ulcers found incidentally at necropsy, since these subjects might well have had ulcer symptoms in life and their death was unconnected with their ulcers. On this basis the incidence of duodenal ulcer in York and in Leeds was surprisingly comparable, but gastric ulcer seemed appreciably less common in York—findings which confirm the regional necropsy survey made in 1956.[4] When the annual risk of developing duodenal ulcer was computed, it again appeared that men living in the city of York were more prone to ulcer than Londoners, the risk being 2·58 per 1000 in York [1] and 2·07 per 1000 in London.[7] The regional differences in ulcer frequency and natural history are at present unexplained.

When ulcer frequencies in town and country were compared by PULVERTAFT [1] interesting differences emerged.

Thus, ulcers were significantly more common in townsmen than in countrymen: frequencies per 1000 population for duodenal ulcer were 2·40 and 1·42, and for gastric ulcer 0·62 and 0·27 respectively (the possibility that differences might have been due to varying age-distribution of the population was excluded). That the differences were in all probability real was further suggested by the fact that acute perforations occurred more commonly in town than in country in a ratio of 1·7 : 1. There was evidence that the differences observed were disappearing with increasing urbanisation of the rural areas, for duodenal ulcer was twice as common in town as in country in 1952 and only 1·3 times as common in 1956.

It was surprising that no statistically significant changes could be demonstrated in women: ulcers were only slightly more common in women living in town than in the country (duodenal ulcer 1·2 : 1, gastric ulcer 1·5 : 1). This disparity was not altered after appropriate correction for the age-distribution of the population at risk.

Variations in ulcer occurrence between town and country could not therefore be explained by differences in age-distribution or social class or by the allegedly increased tempo of town life. York is a quiet cathedral town with good living conditions and it is not highly industrialised. It was possible that the more ambitious ulcer-prone subject might have migrated from country to town, but this could not wholly explain the changes recorded. In an attempt to explain the variations, PULVERTAFT [15] investigated the smoking and, to a limited extent, the dietary habits of his urban and rural populations. Ulcer subjects were compared with a matched control population attending for radiological examinations at York hospitals, subjects with dyspepsia or bronchial neoplasm being excluded. DOLL et al.[16] found that there were significantly fewer non-smokers amongst ulcer subjects than among matched control patients of both sexes; and that gastric ulcers healed more rapidly and completely in patients who had stopped smoking. The York survey confirmed that a higher proportion of ulcer subjects smoked than did control patients both in town (84·3% to 77·8%) and in country (81·6% to 77·7%). Differences observed were barely significant, however, and the proportions of smokers in town and country were almost identical, suggesting that varying smoking habits between town and country people could not explain the differences reported. Food habits proved even more difficult to investigate, but a simple preliminary survey based on the amount of sugar added to everyday beverages suggested that townwellers consumed more sweet and sugary foods than did countrymen. It was also shown that ulcer subjects, both in town and country, ate more sweet food than did control subjects of similar sex and age. Whether this interesting observation has a bearing on ulcer causation in general or whether it might explain regional differences in ulcer occurrence is uncertain, but the subject is being further investigated in York and seems to open up a new path for research into this perplexing problem.

13. Jamieson, R. A. *Brit. med. J.* 1955, ii, 222.
14. Weir, R. D. Unpublished data.
15. Pulvertaft, C. N. Proceedings of the World Congress of Gastroenterology. Baltimore, 1958.
16. Doll, R., Jones, F. A., Pygott, F. *Lancet*, 1958, i, 657.

Annotations

ACROPARÆSTHESIÆ AND THE CARPAL-TUNNEL SYNDROME

SINCE compression of the median nerve in the carpal-tunnel was described by Brain, Wright, and Wilkinson [1] in 1947, light has been thrown upon its nature by observations on the association of this syndrome with pathological conditions, such as acromegaly [2] and myxœdema,[3] in which the connective tissues swell, and attention has recently been directed to its occurrence in pregnancy. In a paper in this issue Dr. Marcia Wilkinson reports fourteen cases in which compression of the median nerve developed during pregnancy, and suggests that trauma, weight increase, and hormonal relaxation of the transverse carpal ligament may all play a part in its pathogenesis. Her further observation that half her patients also showed evidence of compression of one or more cervical nerve-roots is of interest for several reasons. Some, though not all, of these patients showed radiographic evidence of cervical spondylosis. It seems probable that in pregnancy the physiological changes responsible for precipitating the carpal-tunnel syndrome may also produce symptoms by disturbing the normal anatomical relations of the roots of the brachial plexus, and that pressure on the nerve-roots is likelier if there is pre-existing narrowing of the intervertebral discs and foramina in the neck. But the association of cervical spondylosis with the carpal-tunnel syndrome is not uncommon apart from pregnancy, and often provides a difficult diagnostic problem. Is this association merely fortuitous, and due to the fact that both disorders are common in middle age and later; or, as Russell [4] suggests, does a sensory nerve react as a whole to trauma so that a lesion in one situation makes it, as it were, irritable in another?

A further point which emerges from Dr. Wilkinson's observations, and from Russell's view if it is soundly

1. Brain, W. R., Wright, A. D., Wilkinson, M. *Lancet*, 1947, i, 277.
2. Kellgren, J. H., Ball, J., Tutton, G. K. *Quart. J. Med.* 1952, **21**, 405.
3. Murray, I. P. C., Simpson, J. A. *Lancet*, 1958, i, 1360.
4. Russell, W. R. *Med. Pr.* 1958, **240**, 1151.

based, is the undesirability of regarding acroparæsthesiæ as a symptom of a lesion in one particular situation, and of treating this symptom as though it were a disease. Before either the carpal-tunnel syndrome or cervical spondylosis was discovered, acroparæsthesiæ were usually ascribed to some disorder at the thoracic inlet, and Walshe [5] included " acroparæsthesia " among the subtitles of an article entitled " nervous and vascular pressure syndromes of the thoracic inlet and cervico-axillary canal ". He also thought that pregnancy played a part in producing acroparæsthesiæ in the thoracic-inlet syndrome.[6] Later the view that compression of the median nerve in the carpal tunnel was the main, if not the sole, cause of acroparæsthesiæ, gained ground, and the symptom then came to be regarded as an indication for surgical division of the transverse carpal ligament. But there is no doubt that the radicular symptoms of cervical spondylosis include acroparæsthesiæ, which, as in the carpal-tunnel syndrome, may come on during the night. By the time that wasting of the outer thenar muscles has developed, the diagnosis of median-nerve compression is easy; but when the symptoms are purely sensory it may be difficult, in the presence of cervical spondylosis, to decide whether acroparæsthesiæ involving the radial digits are due to median-nerve compression or to a lesion of the 6th and 7th cervical nerves, or possibly both. In such cases measurement of the conduction time in the distal part of the median nerve may be a valuable aid to diagnosis.

Acroparæsthesiæ, then, are no more a nosological entity than headache, but a symptom, which may indicate disturbed function of the sensory nerves supplying the hand at one of three points in their course—the intervertebral foramina, the costoclavicular region, or the carpal tunnel. Before rational treatment can be begun both the site and the nature of the lesion must be determined.

Dr. Foster's paper in this issue, describing the improvement in the carpal-tunnel syndrome produced by injection of hydrocortisone, is further evidence of the part played by œdema in the production of symptoms. The high relapse-rate he reports suggests that his treatment was not removing the cause of the syndrome. Moreover, he was dealing with early cases—two-thirds of his patients showed no abnormal physical signs. It seems, therefore, that surgery is still the treatment of choice for those patients whose disorder is not naturally reversible, as in pregnancy, and has reached the stage of objective damage to the nerve.

SALMONELLÆ IN IMPORTED MEAT

MEAT and especially " meat products " are responsible for more salmonella infections in man than all other kinds of food together. This has been clear in every annual report on food-poisoning issued by the Public Health Laboratory Service; but the reason has been obscure. In this country salmonella infections rank low in importance among the diseases of the larger domestic animals. (Admittedly, many are never reported, but the notifications of human disease are likewise incomplete.) Few animals with obvious salmonella infections reach the slaughterhouse. Attempts by bacteriologists to detect inapparent infections in home-grown carcasses have given very varied results at different times and places, but in general it would be surprising if 1% of these were infected. A recent paper on the bacteriology of imported meat may help to explain this anomaly.[1] The material was of two kinds—chilled carcasses and frozen boneless beef, veal, and mutton. Of 304 samples of the former 3·4% contained *Salmonella* spp.: of 890 samples of the latter, 10·3%. If these figures are broken down into the countries of origin they are even more striking. 18% of samples of boneless veal from country A were found to be infected. From country B both boneless and carcass meat gave figures of 7·5%. Because some of these samples were very small, it would be unwise to read too much into the figures; but beyond doubt quite a lot of infected meat is coming into this country. Incidentally about the same proportion of samples harboured heat-resistant strains of *Clostridium welchii*: without comparable figures from other sources this may mean something—or nothing.

Fourteen species of salmonella were isolated. *S. typhi-murium* was the commonest, and the rest—including one strain of *S. paratyphi B*—represented a fair selection of the species which most often cause food-poisoning in western Europe. What is interesting is that, except for the ubiquitous *S. typhi-murium*, the species found in beef and veal were not those most often associated with bovine disease: *S. dublin*, by far the commonest cause of salmonella infection in cattle in this country, was never isolated. The species in carcass meat have all been found in living cattle (though rarely), but some of those in the boneless meat have never been found in cattle at all. We are admittedly very ignorant of the distribution of *Salmonella* spp. in Nature, but these findings almost suggest that the organisms in this meat were not derived from the living animals but from some extraneous source. None of the exotic species of salmonella recently detected in feeding-stuffs were isolated from this meat.

The authors of this paper are not in a position to tell us about the conditions of slaughter of these imported carcasses or the methods of preparing the boneless meat. Experience shows that one contaminated knife may spread infection far and wide in a butcher's shop. Until more is known of this, it would be idle to speculate upon possible sources of infection of the living animal. Information on this subject is hard to obtain at home, but some Continental countries take meat inspection more seriously than we do. It would be of great benefit if the veterinary profession were to make a really extensive survey of the infection of carcass meat with salmonellæ—say at six large abattoirs over at least two years.

The dangers of this infected meat are obvious, but we doubt whether a cut off the joint is a common source of human infection. As a nation we prefer our meat sterilised. The danger lies mostly in the use of infected meat for making sausages and such savoury delights. Few cooks do more than warm the outside of a sausage, and travellers say that in some backward parts of England sausages are eaten raw. It is astonishing, indeed, that infections are so few; but most of us are probably resistant to all but an astronomical dose of all salmonellæ except *S. typhi*. Protection must be through a change in the composition of sausages or in the national eating habits—and it is hard to guess which is the less likely. Plainly the importation of this infected meat should be prevented so far as possible: the Imported Meat Regulations (1937 and 1948) may or may not apply—a question that can probably be settled only in the courts. Sterilisation by gamma irradiation has been suggested as a remedy, and though this

5. Walshe, F. M. R. Modern Trends in Neurology (edited by A. Feiling); p. 542. London, 1951.
6. Walshe, F. M. R. *Brit. med. J.* 1945, ii, 596.

1. Hobbs, B. C., Wilson, J. G. *Mon. Bull. Minist. Hlth Lab. Serv.* 1959, **18** 198.

method is still in the stage of experiment it ought to be considered seriously. Indeed the whole problem of imported salmonellæ—in meat, poultry, eggs, and offals—has now reached a point when it deserves the attention of the Ministry of Health and the Board of Trade. Unfortunately, in spite of the enthusiasm of the bacteriologists, it is difficult to be sure whether more than a very few human infections are derived from these sources.

CLINICAL RADIOLOGY AND HÆMOPHILIC BONES

THE *Journal of the Faculty of Radiologists* has been renamed *Clinical Radiology*; and important changes have been made in its format. The policy of the editorial board remains "the publication of scientific papers of interest to diagnostic radiologists and to radiotherapeutists with the main emphasis on clinical radiology". But papers on experimental and similar work with clinical implications will be welcomed; and the first number [1] includes a paper on metabolism of radioactive materials in the human body by Prof. W. V. Mayneord, and one on marrow transplantation after radiation by Dr. K. A. Porter. It also includes a most interesting article on bone and joint changes in hæmophilia and Christmas disease, by Dr. J. H. Middlemiss, of Bristol, which is illustrated by many excellent and unusual radiographs.

One of the commonest manifestations of hæmophilia is hæmarthroses. The bleeding into a joint is often repeated, the same joint being involved on several occasions; this causes damage to the structures in the joint and curious and characteristic lesions in the bones, especially in the epiphyses.

The joints most usually affected are the knees, ankles, and elbows; hip-joints and shoulder-joints are less commonly involved. Repeated hæmarthroses can eventually cause much deformity and serious limitation of mobility, and they account for the presence of so many hæmophiliacs in homes for cripples. The synovial cartilage is slowly destroyed, so the joint space becomes steadily smaller; so-called cysts, sometimes multiple, appear subarticularly below the bone surface. In children the intense periarticular hyperæmia associated with recurrent repair processes causes accelerated growth, and exceptionally large epiphyses may be formed. When the patient grows up unusually large bone ends may be formed in joints that have been involved in repeated hæmarthroses, and Dr. Middlemiss has a striking radiograph showing how one femoral head has become larger than the other from this cause.

Illustrations show other ways in which radiology can help in hæmophilia. For example, intermittent small-bowel obstruction develops sometimes in hæmophilic children, and a plain film of the abdomen shows such a case due to intussusception. A retroperitoneal hæmatoma in the right iliac fossa gives rise to symptoms and signs that closely mimic those of acute appendicitis. Operations are still to be avoided whenever possible in hæmophilia, and Dr. Middlemiss reproduces plates showing firstly the obliteration of normal landmarks on the right side of the abdomen with displacement of the bowel shadows to the left, and secondly an excretion urogram with the right ureter displaced medially by the retroperitoneal hæmatoma. In such a case laparotomy is unnecessary. Another odd condition may be found (usually in the iliac bones): repeated subperiosteal hæmatomas cause atrophy of the underlying bone, and eventually a large area is destroyed; some new bone may be formed in the hæmatoma mass. This "pseudo-tumour" gives a very characteristic radiographic picture, which again is very well illustrated. This paper should be consulted by all interested in hæmophilia and in joint disease. It and its companions in the first issue of *Clinical Radiology* set a high standard.

1. *Clinical Radiology*, 1960, **11**, no. 1. Published by Messrs. E. & S. Livingstone, Edinburgh and London. Subscription £3 3*s*. per annum (four issues).

CELLULAR ORIGIN OF RHEUMATOID FACTOR

THE great majority of patients with rheumatoid arthritis have in their plasma a factor capable of agglutinating diverse particles coated with γ-globulin.[1] Various refinements of the original test have increased its sensitivity, and a positive reaction is now obtained in nearly all patients with the disease. The site of origin of this factor, its relationship to a true antibody, and the nature of the γ-globulin with which it reacts are still somewhat obscure.

The origin of the rheumatoid factor has been fruitfully studied by Mellors and his colleagues,[2] who applied Coons' fluorescent-antibody method. It had already been established that human γ-globulin heated to 62°C for ten minutes reacted specifically with the rheumatoid factor.[3] A histochemical reagent for detecting the factor was therefore prepared by the heat-aggregation of γ-globulin after it had been conjugated with fluorescein isothiocyanate. Sections of fresh frozen tissue treated with this reagent should, when viewed with ultraviolet light, show by an applegreen fluorescence the histological sites of distribution of the rheumatoid factor. With this reagent tissues from 10 patients with rheumatoid arthritis were studied. A control group of 22 patients without rheumatoid arthritis included many with other forms of chronic arthritis such as traumatic and degenerative osteoarthritis and tuberculous synovitis. The tissues studied included synovial membrane, lymph-nodes, subcutaneous nodules, skin, and muscle. The results were quite unequivocal. The rheumatoid factor was found exclusively in the tissues of the rheumatoid patients and was identified in only two cell types—plasma cells and the reticulum cells of the germinal centres of some lymph follicles. In the synovial membrane the positive cells constituted a small minority of the plasma cells present, while in the affected follicles all the reticulum cells were stained, but these follicles constituted only about 10% of those present. Positively stained plasma cells were also present in the affected lymph-nodes but were restricted almost entirely to the medullary cords.

Since the rheumatoid factor belongs to the group of γ-globulins with a sedimentation coefficient of 19S, confirmation of the above results was sought by using a fluorescent rabbit antibody specific for this fraction of human serum. The cells stained by this reagent always included those stained by the fluorescent-aggregated γ-globulin. It was not confined to these, of course, because not all 19S globulins have the specificity of rheumatoid factor.

The results do not prove that the rheumatoid factor is an antibody. True, the factor is apparently formed by cells now widely accepted as responsible for the synthesis of circulating antibody; but, as Mellors points out, these cells can synthesise non-antibody protein—for example, in multiple myelomas. Nevertheless the distribution of the factor is exactly what would be expected were it indeed an antibody.

As regards the nature of the γ-globulin with which the factor reacts it is difficult at present to decide between two

1. Ziff, M. *J. chron. Dis.* 1957, **5**, 644.
2. Mellors, R. C., Heimer, R., Corcos, J., Korngold, L. *J. exp. Med.* 1959, **110**, 875.
3. Christian, C. L. *ibid.* 1958, **108**, 139.

hypotheses: the first accepts the reactant as normal γ-globulin with a sedimentation coefficient of 7S,[4] and there is convincing evidence that in vivo the rheumatoid factor exists as a complex between several molecules of 7S globulin and a molecule of 19S globulin. On this view the precipitation of the factor with aggregates of 7S globulin is due entirely to the more ready precipitability of the large molecular aggregates. According to the second hypothesis the aggregation of the reactant molecules is of secondary importance, the primary necessity for the reaction being some change in shape of the molecules brought about by heat or by their adsorption on to various surfaces.[5] Unless there is some change of this sort, it is difficult to understand why, for example, the 19S rheumatoid factor should exchange its associated normal 7S globulins for those on a latex particle or a sensitised red blood-cell.

GOODBYE TO "METABOLIC INSUFFICIENCY"

THE syndrome of "metabolic insufficiency" or "non-myxœdematous hypometabolism"[6] has been defined[7–11] as a condition in which such symptoms as fatigue, weakness, and nervousness are associated with a low basal metabolic rate, normal serum-protein-bound iodine, and normal uptake of radio-iodine by the thyroid gland. Patients with this syndrome are said to respond well to triiodothyronine, but not to thyroxine or thyroid extract; and a peripheral defect in ability to respond to thyroxine has been postulated. We have previously expressed scepticism about the existence of this syndrome,[6] together with some concern at the possibilities its supposed existence offers for commercial exploitation. We suggested that the crucial issue was whether these patients really responded to triiodothyronine but not to thyroxine, and that the only satisfactory way of deciding this was by a properly conducted "double-blind" trial.

This suggestion has now been acted on by M. E. Levin,[12] of St. Louis, Missouri. 22 patients were identified by the criteria listed above (these were all that could be found in a year's study of 2290 medical outpatients). Detailed studies were made on 6 patients with the syndrome. Each received thyroxine (0·3 mg. daily), or triiodothyronine (0·075 mg. daily), or an equivalent number of lactose tablets, in random sequence for periods of a month. All tablets appeared identical, and the investigator did not know which medication the patient was receiving. The final statistical analysis showed no significant differences in the frequency with which symptoms were relieved by the three types of tablet.

In this group of patients neither thyroid hormone caused any greater subjective improvement than lactose tablets; and triiodothyronine was in no way superior to an equivalent dose of thyroxine. The symptoms therefore cannot be attributed to any form of hypothyroidism, or to irresponsiveness to thyroxine. Since Levin also showed by psychometric tests that these patients had abnormal personality patterns, it seems likely that their symptoms were essentially psychogenic. This careful trial provides the first objective evidence about "metabolic insufficiency". Since the results were entirely negative it reinforces the doubts we previously entertained about the existence of this syndrome. We hope that "metabolic insufficiency" will quietly disappear from medical literature.

4. Edelman, G. M., Kunkel, H. G., Franklin, E. C. *ibid.* p. 105.
5. Glynn, L. E., Holborow, E. J., Johnson, G. D. *Proc. R. Soc. Med.* 1957, **50**, 469.
6. See *Lancet*, 1956, ii, 826; *ibid.* 1957, ii, 992.
7. Freedberg, A. S., Kurland, G. S., Hamolsky, M. W. *New Engl. J. Med.* 1955, **253**, 57.
8. Kurland, G. S., Hamolsky, M. W., Freedberg, A. S. *J. clin. Endocrin.* 1955, **15**, 1354.
9. Tittle, C. R. *J. Amer. med. Ass.* 1956, **162**, 271.
10. Fields, E. M. *ibid.* 1957, **163**, 817.
11. Morton, J. H. *ibid.* 1957, **165**, 124.
12. Levin, M. E. *J. clin. Endocrin.* 1960 **20**, 106.

INSTITUTIONAL POPULATIONS

OUR institutions serve a variety of purposes, and the people in them are a mixed company with little in common save that they have all been deprived of something—children of the care and support of their parents, old people of the strength and activity which gave them independence, patients of mental or physical health, and prisoners of their liberty. Though institutions are an essential part of our social service we are beginning to realise that they should be used sparingly. Wherever possible, children should be found foster families, old people should be supported in their own homes, mental patients should be looked after in the community, young delinquents should be put on probation. On the other hand practical difficulties—small families, cramped housing, women with jobs, complex medical procedures—balance this theoretical shift of social care from the institution to the community, and information about the use that is in fact being made of our institutions today would be a helpful guide to planning the social services of tomorrow. Dr. Brian Abel-Smith and Mr. Robert Pinker[1] offer some pointers about this in their comparison of institutional populations in 1911 and 1951.

Though changes in administrative procedure and in official classifications naturally preclude an exact comparison, they have been able to reach some broad conclusions which are of interest. They have divided institutional populations into the physically ill, the mentally ill, welfare cases, and lawbreakers. Between 1911 and 1951 the physically ill appear to have increased by 21% and the mentally ill by 26% more than would be expected from demographic changes alone, which suggests that despite the expanding domiciliary services there has been no decline in the proportion of people looked after in hospitals. On the other hand the proportion of the population looked after in welfare institutions (in which they include homes for children, cripples, blind, deaf and dumb, epileptics, and the aged and infirm) fell by nearly 51%. The confinement of lawbreakers increased by 36%.

Analysis of the figures according to sex, age, and civil state was also complicated by changes in procedure and terminology. But there has been a clear decline in the age of offenders. Again, among the mentally ill the proportion of single people in institutions doubled between 1911 and 1951 for both sexes. The increase was greatest among those under 45, but this may be partly due to people in the workhouses of 1911 who would today be classified as mental defectives. The proportion of people over 65, making a similar allowance for the workhouse population, decreased between 1911 and 1951. Among the welfare cases there seems to have been unhappily a considerable increase in the proportion of children and an unexpected but welcome decrease in the proportion of the aged, particularly men, in institutional care.

Dr. Abel-Smith and Mr. Pinker emphasise that their study makes no claim to measure social needs or physical or mental morbidity, but they believe that at the very least their conclusions "do not support theories of increasing family neglect or of a trend towards 'medicated survival'".

1. In a paper to the Manchester Statistical Society on Feb. 10, 1960.

EUROPE'S REFUGEES IN 1960

A Lancet Survey

The World Refugee Year was launched last June in accordance with a resolution by the General Assembly of the United Nations, which named the aims as: (1) to encourage interest in refugees and to secure additional financial contributions; and (2) to provide additional opportunities for permanent solutions, through voluntary repatriation, resettlement, or integration. In the United Kingdom a central committee was set up, with the following objectives: to aid the 160,000 unsettled refugees in Europe who came under the mandate of the United Nations High Commissioner for Refugees; to promote settlement of the 8000 European refugees on the mainland of China; to aid the Chinese refugees, numbering close on a million, in Hong Kong; and to aid the million refugees (nearly all Arabs) from Palestine.

This account of refugees in Europe is based on the observations and inquiries of a member of our staff in Italy, Austria, and Germany.

THE BACKGROUND

It is all too easy to think and speak of refugees either, on the one hand, as units to be added to a statistical table or, on the other hand, in terms of emotional anecdote. In fact the refugee is an ordinary person in an extraordinary position: his need, like that of the next-door neighbour in trouble with his bank overdraft, is for informed and dispassionate advice and well-directed help. Each new refugee is an emergency; for the longer he is denied a full productive place in society, the harder will it be for him to take such a place—and incidentally the heavier will be the charge on those who sustain him in unwilling idleness.

In Europe, as elsewhere, the refugee situation is never static: a refugee may return to his own country, settle where he has first sought asylum, emigrate, or even move illegally to a second country where he believes the prospects to be brighter. And all the time some countries—notably Italy and Austria—are receiving new refugees. Consequently, no estimate of numbers is ever up to date.

Last autumn, according to the office of the United Nations High Commissioner for Refugees (U.N.H.C.R.),[1] Germany, Austria, Italy, Greece, and France had 110,000 refugees (including 22,000 in camps), compared with 160,000 (including 40,000 in camps) a year earlier; and this reduction was achieved despite an influx of 6000 new refugees during the year.

These totals, however, include only those who satisfy the exacting U.N. definition of a refugee—namely, one who has been driven from his country by political or other persecution or by fear of such persecution. The definition excludes the migrant who belongs ethnically to the country in which he seeks asylum (such as Pakistanis and Indians who were the victims of a new demarcation line, and the Vietnamese and Koreans who moved to the south of their countries during and after wars). It also excludes " economic " refugees who migrate in search of work. Thus the total of unsettled immigrants in Europe is far greater than 110,000; those who do not fall within the U.N.H.C.R.'s definition are in danger of being returned to their own country, and are anyhow at a material disadvantage.

Owing to differences in the interpretation of " refugee " and the narrow U.N.H.C.R. definition, the totals shown by the Government, by U.N.H.C.R., and by the Intergovernmental Committee for European Migration (I.C.E.M.)[2] are widely discrepant.

The immediate help and the eventual solutions offered to the refugee differ distinctly between one country and another. Whether the refugee is encouraged to stay or to move on depends partly on the economy of the recipient country. Thus neither Greece (where refugees are relatively few) nor Italy (where they are much more numerous) is interested in refugees as a source of labour. Indeed, Italy has 2 million unemployed or underemployed of her own and no fewer than 400,000 of her citizens in camps up and down the country[3]; and a steady stream of Italians moves out of the country to more prosperous areas, including the German Federal Republic. Germany, by contrast, with her bustling economy has an economic interest in retaining all who are fit to work. (Likewise, she is politically interested in retaining the 12 million of her nationals from East Germany as a lever in her efforts to secure reunification. These 12 million do not rank as refugees under the U.N.H.C.R.'s definition.) Austria occupies a middle position. Though her unemployment figure is fairly high, especially in winter, she may wish to add to her labour force in order to hasten industrialisation of the relatively undeveloped eastern region; but she is anxious not to swamp her own small population of $7^1/_2$ million with foreign nationals.

Such considerations, however, are certainly not in the foreground in Italy and Austria, which, at great cost to themselves, have (like Germany) steadfastly kept the door open to all proved refugees and have, it may be thought, treated the " economic " refugees not ungenerously.

A recent brief visit to Italy, Austria, and Germany left three main impressions: first, that refugees should be accepted as an international responsibility, the cost at present falling far too heavily on a few countries; secondly, that with effort and good will the tragic situation of the " old " refugees[4] can be transformed; and thirdly, that the machinery for dealing with refugees, which has been built up piecemeal over the years, is unworthy either of those who operate it or of those for whom it is operated.

The following account is devoted chiefly to Austria

1. The office of the U.N.H.C.R., the successor of the International Refugee Organisation, is financed by direct contributions from Governments. Its main concerns are to protect the interests of refugees falling within the U.N.H.C.R. definition, and to help to provide for their settlement or emigration; but U.N.H.C.R. is itself non-operational.

2. I.C.E.M. was created in Brussels in December, 1951, to help to restore the equilibrium between the overpopulated and the underpopulated nations through orderly migration of Europeans who could not emigrate without international assistance. Under its aegis nearly a million emigrants (45% of them refugees) have left Europe. I.C.E.M. has close ties with, but is distinct from, the United Nations. At present 29 countries are members. Strangely the United Kingdom is not a member—a defect which it is believed will soon be repaired.

3. These Italians are from the former Italian islands in Greece, from Egypt, from Tunis, from former Italian colonies, and from territory ceded to Yugoslavia.

4. " Old " in this context denotes, in the case of Hungarians, those who sought asylum before Oct. 23, 1956, and, in the case of other nationals, those who sought asylum before the beginning of 1956.

because (though the numbers are admittedly smaller than in Germany) great progress has been made towards securing integration or emigration for all, and because the emphasis is not mainly on emigration (as in Italy) or mainly on integration (as in Germany) but on both together.

AUSTRIA

NEW REFUGEES

About 300 people a month cross the border illegally from Yugoslavia.

Each is interviewed by the police, who decide whether he shall be graded as a political refugee. The decision is conveyed to the representative in Austria of the U.N.H.C.R., who may make representations on the decision. If no agreement is reached, a joint meeting is held; but naturally the final decision rests with the Austrian Government.

Since last September those seeking asylum have been sent to a central reception centre in Traiskirchen, where their applications are investigated. Only a very few are returned to the border: all others either remain in Austria or seek to emigrate.

On entry to the country the refugee registers with I.C.E.M. and a voluntary agency,[5] to which he looks for counsel and help in arranging emigration or settlement, for supplementary food and clothes and money, and for moral support. If he wants to settle in Austria he may seek grants from his agency, U.N.H.C.R., and the United States Escapee Programme (U.S.E.P.),[6] and apply to the *Arbeitsamt* for work. If he wishes to emigrate he may have to wait for two years.

Of the "*new*" *Yugoslavs* (i.e., those who have entered Austria since the end of 1955) the majority (rather over 60%) are single men aged 18–40; about 15% are single women, 12% family units, 6% childless couples, 2% over the age of 60, and 0·5% unaccompanied youths under the age of 18. Of the 2100 unsettled Yugoslavs in the country in January, all but 100 had declared that they wished to emigrate.

There is an interesting contrast between these "new" Yugoslavs and the remaining "*new*" *Hungarians* (i.e., those who entered Austria in 1956). Of this second group family units account for over 40%, single men for 25%, childless couples for 20%, single women for 10%, and unaccompanied youths or elderly people for the rest. Moreover, of the 10,000 remaining unsettled Hungarians, no fewer than 7000 say that they want to stay in Austria. Many of these could have emigrated; but they chose to remain, partly perhaps because they feel at home in Austria, which was formerly linked with their country in the Austro-Hungarian Empire, but mostly because they believe that here better than elsewhere they can keep in touch with relatives across the border.

NEW AND OLD

The task of establishing the number and whereabouts of all refugees in the country is enough to make a statistician blench.

On Jan. 1 of this year there were 56,526 refugees in Austria under the U.N.H.C.R. mandate. Of this total, 6442 were living in camps and institutions under the federal administration, and 1186 were accommodated in homes or institutions owned by the various voluntary agencies; 1267 were in unofficial camps. The remainder (47,631) were living in private accommodation; and, of these, about 17,000 were unsettled. In addition there are about 270,000 one-time refugees who have taken Austrian nationality, including 10,000 living in camps administered by the federal authorities. These people belong to one of eleven or twelve nationalities, with Yugoslav and Hungarian predominating. 26,000 have registered with I.C.E.M.

ARRANGEMENTS BY GOVERNMENT, U.N.H.C.R., AND AGENCIES

Accommodation

The 137 unofficial camps contain only "old" refugees (40% ethnic Germans or Austrians and 60% foreign-speaking). These camps, of which some are privately owned, some belong to local authorities, and some are accidental aggregations, are (judging by the few seen) mostly pathetic shambles—dilapidated wooden shacks without semblance of satisfying primitive requirements. The 42 official camps, run by the Government, are better: often wooden Army huts, weatherproof and with more or less reasonable sanitation, but without protection from

5. Some of these agencies are religious and others are "national" organisations ("national" here meaning of the refugees' nationalities). The national agencies seem likely to dwindle or disappear. This is perhaps regrettable as a refugee may be dealt with more understandingly by one of his own nationality. On the other hand, some of the national agencies are not interested in securing integration, even though this may seem the most suitable solution. All agencies draw by far the greater part of their funds from voluntary contributions; but U.N.H.C.R. subscribes to the cost of their social workers and counsellors. Shortage of such workers is seriously impeding the work of most agencies.

6. U.S.E.P. was established in 1952 to aid in the reception, care and maintenance, and resettlement of escapees from the Iron Curtain area of Europe and Asia. This assistance, provided through voluntary agencies working under contract, is supplementary to that offered by international organisations. The programme is administered by the Office of Refugee and Migration Affairs, Department of State.

the noise of children next door or from the unwelcome visitor who calls at the front door which is also the bedroom door.

The Government aims to close all official camps by the end of 1962, rehousing those who do not emigrate in flats —which in some cases are being built on the site of the camp. 4000 flats are going up under a joint U.N.H.C.R. and Government scheme, each contributing, on average, 50% of the cost. These flats are excellent—spacious and well found. But the provision of a new home does not in itself solve any problem. A family which for years has been accustomed to the " security " of camp life needs strenuous preparation for the responsibilities of a home; and, having moved in, it will still need wise counselling, especially as there is little enough money for the unexpectedly heavy expenses unless the family includes a breadwinner.

This is not the fault of the Austrian Government which, with singular openhandedness, treats all refugees, with regard to financial and social benefits, as if they were Austrian citizens.

Under the social welfare scheme an unemployed single man receives 360 Austrian shillings a month (there are about 72 Austrian shillings to the pound sterling). A married man receives 560 Austrian shillings, plus 180 shillings for each child, per month. In official camps an unemployed man pays nothing. An employed man pays 35 Austrian shillings a month for rent and 8–9 shillings a day for food. In a flat he pays likewise 35 shillings a month, and the difference between this and the 100 shillings which is the economic rent is contributed by the Government. Because the U.N.H.C.R. contribution to the building cost is interest-free, the economic rent is somewhat lower than it would ordinarily be. Moreover, experience and standardisation are enabling the authorities to erect four flats for the cost of three earlier ones.

The restricted U.N. definition of " refugee " has given rise to difficulty. The Austrian Government relaxed its naturalisation laws to enable some ethnic Austrians to become nationals of the country. These people then automatically lost the chance of obtaining a flat under the joint U.N.H.C.R.-Government scheme. Accordingly, the Government has instituted a parallel scheme to build flats wholly at its own expense; but this is grinding to a halt for lack of money. Political pressure against this scheme is strong, as these " new " Austrians are commonly still regarded as foreigners who should receive no preferential treatment. They seem to have had the worst of both worlds.

Medical Care and Health

Hospital and other medical care is provided by the Government for refugees, in or out of camps, on the same terms as for Austrian citizens. The Government has set up a special home for unmarried mothers and their children.

A special sanatorium—which has a high reputation—exists for refugees, but fewer than 30 active cases of pulmonary tuberculosis are known to the authorities. In 1957 I.C.E.M. X-rayed on 70 x 70 mm. film the 18,000 remaining Hungarians, and found active or arrested tuberculosis in about 2·5%. Positive findings were reported to the local chest clinic and to the Ministry of the Interior. In 1958 I.C.E.M. initiated a similar survey of " new " Yugoslavs. Unfortunately this survey was terminated owing to lack of funds; but in the 400-500 cases examined the rate was again about 2·5%.

Disorders that seem to be especially prevalent include " weakness of the heart " (in most cases the symptoms are those of effort syndrome), hypertension, dyspepsia (possibly occasioned in some by unfamiliar food), and rheumatism.

EMIGRATION

Both Canada and Australia have in Austria permanent missions which select healthy and socially acceptable individuals and families for emigration under mass schemes. The age-limit is 45, or exceptionally 50 when family units are being selected. Close on 6000 emigrated in this way last year.[7]

At present, of I.C.E.M.'s case-load of 26,000, some 10,000–12,000 have declared that they want to emigrate; but any such estimate is bound to be inaccurate because a person who has been rejected again and again for emigration under mass schemes (as many have) tends to despair and not to bother to declare his wish to leave the country. Experience has repeatedly shown that many who have previously expressed no interest in emigrating seize on a firm offer when this is made under a special scheme.

The medical criteria for selection under mass schemes are confidential; and neither the refugee nor I.C.E.M. is officially informed of the reason for rejection. Thus a refugee may spend a year or longer presenting himself to one mission after another, and, having failed with all, still be in the dark as to the cause of his failure.

Although the criteria are not published, some of those rejected could clearly be brought up to the required standard by fairly simple measures—perhaps a hernia operation or even just the provision of spectacles. It is thus most important that each would-be emigrant should have at his disposal the advice of doctors who know roughly the missions' requirements and how they can be met, and who can inform those who have no hope of meeting these requirements: there can surely be nothing more demoralising than to move from mission to mission, each time being denied for reasons untold.

This need is well exemplified by suspected tuberculosis. The doctor examining for mass emigration usually has at his command a single chest radiograph (tomography is occasionally arranged). Sometimes the doctor defers a candidate so that he may compare the findings over a period—a delay that could be avoided if each candidate were offered radiographic examination on entry to the country and the film (with the candidate's permission) were placed at the disposal of any mission, whose doctor could then compare this first film with that taken when the candidate presented himself. Impartial medical advice at the outset, on the basis of the first radiograph, would spare some candidates months of wasted time and mounting anxiety.

The task of the mission doctors is to select the healthy, and naturally they tend to reject or defer any person with the slightest hint of tuberculosis. Last year the Australian mission in Austria examined 2045 persons and deferred or rejected 36 (about 2%) on account of the radiographic findings. The total examined by the Canadian mission was 2400, of whom 113 (about 5%) were rejected on this ground. Further investigation, if this were possible, might satisfy the mission doctors in at least some of these cases.

THE " HARD CORE "

In Austria, as in Italy, the emigration of the young and healthy has tended to raise the proportion of the elderly

7. The cost is shared by I.C.E.M., the Austrian Government, the Government of the recipient country, and in many cases U.S.E.P.

and less fit. I.C.E.M.'s " caseload " in Austria of 26,000 includes about 6000 elderly or medically unfit and about 4000 socially unfit. These are the " hard core "—some of whom are scarcely more likely to establish themselves in their first country of asylum than in another. Their efforts are watched with frustration by those who want to help. In the words of one experienced worker: " It takes as long to settle a single hard-core case as to organise the emigration of a thousand healthy people "; while another declared that a social worker would be doing well if she organised the integration of two hard-core families in a month.

Elderly and Medically Unfit

Those rejected because they are over-age are especially difficult to settle. Often they have a trade for which no local demand exists. No longer resilient, they find it hard to adapt to a new language and new ways. Thus a 57-year-old labourer refused the chance to emigrate under a special scheme to Norway, where materially his future would have been assured—probably because he could not bring himself to exchange the familiar *Gemütlichkeit* of Southern Europe for the more reserved mode of the North. In this group are found both doctors and lawyers, who are the hardest of all to place: no country wants them as such.

The amount of medical unfitness is difficult to assess; but an I.C.E.M. survey of 12,000 in Austria two years ago revealed the following figures: active or inactive tuberculosis, 500; mental disorder, 89; paralysis, 52; other chronic disorders, 72; partial blindness, 140; total blindness, 11; deaf and dumb, 48; amputees, 77; other physical infirmities, 386; vague and transitory disorders, 281; unclassified, 200.

Socially Unfit

Austria has given a fine lead in establishing a home for unmarried mothers and their children; but otherwise only Sweden and the United Kingdom have accepted any of these. The " unaccompanied " mother (whether her husband is dead, divorced from her, or still in the country of origin) is equally unlikely to be accepted; and yet, if only for the child's sake, this group should surely not be excluded.

Likewise few countries have been willing to accept criminals. Any person with a record of a crime, however small and however ancient, is generally debarred from emigrating. A man who in a moment of heat struck an insulting relation of his former wife received a trifling sentence and thus disqualified himself from leaving Austria.

Similar cases were recited in Germany. Petty crimes, committed long ago and long ago deleted from the German register of crimes, prevent refugees from leaving the country. Examples are blackmarketeering, collecting scrap metal without a permit, collecting cable in bombed houses, and insulting an official. One worker in Germany suggested that a person with no crime recorded against him for three years should be regarded as having a clean sheet.

ITALY

Italy has some 5000 refugees in seven official camps [8] and a further 15,000 who are more or less integrated in the community, though some 4500 are living at bare subsistence level and need continued help. About 95% are Yugoslavs.

8. These camps are at Trieste, Capua, Aversa, Farfa Sabina, Fraschette, St. Antonio (nr. Salerno), and Latina.

Yugoslavs continue to cross the border into the country at the rate of 10–20 a day. Their claim to refugee status is examined by a commission comprising 2 representatives of the Italian Government and 2 members of the U.N.H.C.R.'s office. About 65–70% are accepted as refugees; some of the remainder are returned to Yugoslavia.

Nearly all who remain seek to emigrate. About 90% succeed (5000 left the country last year), the great majority going to Australia; the rejected 10% remain in the country.

Some emigration schemes in Southern Europe are less attractive than others. Under a scheme for selection of trainee gold-miners for South Africa, the emigrant must undertake to stay at this work for at least four years, the penalty for breach of the undertaking being expulsion from the country.

In Italy the refugee receives no money but is accommodated and fed by the Italian Government, at a cost of about 750 lire a day (there are about 1700 lire to the pound). According to some reports, the food in these camps is poor; but it appeared to be adequate. Meat is served every day except Friday (when it is replaced by fish); and indeed there are authenticated reports of refugees in camps in the south selling their daily portion of meat to the less well-fed local people outside.

Some of the camps are better than others; and that at Latina, in the Pontine Marshes, which is the " processing " centre for emigration, seems to be about as good and contented a place as any camp can be. The attitude of the camp commandant largely determines the atmosphere; and in this camp the commandant is keenly interested and has done his utmost—for example, by pressing for amenities and by establishing a gaily coloured garden in the central compound—to diminish the bleakness associated with all such places.

The refugee in Italy may with luck be given odd jobs in the camp, for which he is paid. He is not supposed to work outside, but some in fact do find seasonal employment. A refugee who has been in the country for three years may, if he finds permanent employment, secure a work permit; and he then gains all the social benefits of an Italian citizen. Citizenship of the country can be secured only with difficulty and after a long time.

U.N.H.C.R. is running a camp-clearance scheme, for inclusion in which the main qualification is entry into the country before 1956. At the end of June, 1959, the 269 who qualified were of the following nationalities: Yugoslavs (164), Russians who left their country before 1939 (25), Poles (21), Albanians (17), Bulgarians (12), Czechs (8), Hungarians (7), Russians who left their country after 1939 (5), Roumanians (4), Ukrainians (3), and Spaniard, Estonian, and Latvian (1 each).

At the end of this January 224 people qualified (two years ago the total was close on 600). Those who are not accepted by other countries U.N.H.C.R. is trying to place in settlements—communities with care. These settlements will never be entirely self-supporting, and will be a continuing charge on the Italian Government.

MEDICAL SURVEYS

Since September, 1959, I.C.E.M. has operated a continuous survey, including chest radiography on 100 mm. film, of newly arrived refugees, all of whom go through the camp at Trieste. (The Trieste camp, a converted warehouse, is far less satisfactory than that at Latina.)

I.C.E.M. has also lately surveyed all in-camp refugees. (For technical reasons children under the age of 12 were not examined radiographically.) Analysis is not yet completed; but of 4467 examined radiographically, 64 single adults and 27 members of families were found to have active or presumably active tuberculosis. Positive findings were reported to the camp doctors. This survey should prove of great value, because, although the camp doctors make periodic physical checks, active tuberculosis has hitherto been brought to light in many cases only when the refugees have submitted themselves for emigration.

GERMANY

If Germany has been left to the last in this report, it is certainly not because in that country refugees are fewer or their problems smaller than elsewhere. According to U.N.H.C.R., on July 1, 1959, non-German refugees under the High Commissioner's mandate numbered about 11,900 in 52 official camps. Most had been there for ten years or longer.

In 1957 a survey by the *Akademie für Staatsmedizin* in Hamburg showed that the official camps contained about 2200 " difficult " cases (i.e., refugees who were old, sick, or handicapped, and in need of permanent care).

The estimated total outside official camps last July was 190,000, of whom 28,000 were unsettled. They included about 11,000 " difficult " cases. Many of those outside official camps live either in unofficial camps or in other grossly unsatisfactory places, such as cellars. The vast majority in official camps and elsewhere are " old " refugees.

HOUSING

Apart from the " difficult " cases, the great problem is housing: except perhaps in Bavaria, which has a great concentration of refugees, no reasonably fit adult should find it hard to secure some sort of work.

In Munich alone, there are some 40,000 families on the " urgent " waiting-list for dwellings built by the local authority. Of the 3068 dwellings completed last year, 1141 were reserved for German refugees.

Between September, 1955, and the end of 1959, of a total of 1575 housing units planned under a special programme initiated by the United Nations Refugee Fund for refugees in official camps, 1154 had been completed. Together with 1300 units planned under the camp-clearance scheme of U.N.H.C.R., the total is to be brought up to 2900 units. U.N.H.C.R. is contributing an average of 25% of the cost, with a matching contribution of 75% from the Government.

Of the unofficial bodies, the Adoption Committee for Aid to Displaced Persons,[9] a non-denominational organisation, is doing outstanding work. Concentrating mainly on the " free-livers " in Bavaria, who are perhaps the worst-off of all, it is providing " key-money " to enable refugees to rent privately owned flats, with priority to those who have recovered from tuberculosis. In addition it is largely financing the construction of a new home for the tuberculous who have been discharged from hospital but are not fit to take their chance in the community. The Adoption Commitee is the first organisation to have applied sizeable funds to the integration of those in unofficial camps; but now U.N.H.C.R. is surveying the numbers and needs of those in these camps—in preparation, it is to be hoped, for action.

9. 227, Edgware Road, London, W.2.

SOCIAL BENEFITS AND MEDICAL CARE

In Germany the refugee who is unemployed or falls ill receives the same benefits as a German citizen. The great majority of refugees are employed, though the employment—especially of labourers—may be only seasonal. A labourer earns up to 400 D.M. a month (there are about 12 Deutschmarks to the pound); and if he is living in a privately owned flat, which will cost at least 150 D.M. a month, he will have difficulty in making ends meet.

After two or three years German nationality can be obtained. Most, however, choose to remain Stateless—possibly because they hope eventually either to emigrate or to return to their homeland.

In hospitals the refugee is treated on a par with a German citizen; and sometimes he is clearly better off in hospital than outside. For instance, at Gauting Sanatorium, near Munich, the tuberculous can serve a two-year apprenticeship as mechanics: the workshops are beautifully equipped and well staffed, and failure to gain a diploma at the end of the two years is unknown. The refugee who gains such a diploma emerges as a skilled worker. German sanatoria also house some middle-aged and elderly tuberculous refugees who have been there for up to ten years, the chronicity of their lesions perhaps being traceable to hardship in concentration camps or forced-labour camps, and to separation from friends and relatives and the conviction that no-one cares greatly how they fare.

THE NEW REFUGEE

Those who come newly to the country as refugees are accommodated at Valka camp, near Nuremberg. Originally built twenty-seven years ago for those attending Nazi Party rallies, it is in an appalling state. The German authorities are alive to this, and by the end of the year it is to be closed and the remaining refugees transferred to the nearby Zirndorf camp, which is already partly built. Thus the worst and the best of the German official camps are cheek by jowl.

The decision as to refugee status rests with the courts; but where recognition is refused an appeal may be taken to first one higher court and then another—a process which may take up to three years. It is unusual for an immigrant to be returned to his country after this time.

Of the new refugees 90% are Yugoslavs. Until their status is decided they are supposed not to take employment; but not uncommonly they engage in work without an official permit (so-called " black " work).

At Valka routine radiographic examination was instituted in 1950 but was later abandoned. Last July it was resumed; and in order to gain full attendance the authorities have had to withhold meal tickets and pocket-money from those who fail to attend. (This failure, it seems, is usually due, not to the refugee's fear of what may be found, but to his being absent and engaged on " black " work when the radiography unit visits the camp.)

EMIGRATION

According to I.C.E.M., U.N.H.C.R. refugees who left Germany for resettlement elsewhere numbered 5243 in 1955, 8982 in 1956, 6967 in 1957, 1151 in 1958, and 2199 in 1959.

CAMPS IN GENERAL

"When you've seen one camp, you've seen the lot." The man who said this knew he was uttering a half-truth. Certainly the worst camps look and sound and smell depressingly alike: the bottle of liquor dropped by the alcoholic on the doorstep; the miserable dog which seems never to know where it belongs; the dark, dirty, creaking corridor; the mean rooms decorated incongruously with bright pictures from old magazines; the bunks strewn untidily with blankets; the old table (but no chairs); the acrid stench from the urinal; the sudden sound of a quarrel beyond the partition—these are the common denominators of camps at their worst. Camps also have basically the same atmosphere—an atmosphere of insecurity and isolation, as of a prison without bars. The visitor, wherever he turns, comes on little knots of two or three, standing or lounging on their bunks, exchanging gossip and rumours in subdued tones, and breaking off to regard the newcomer with uninquisitive wariness.

Those with knowledge say that in camps the attitude is basically paranoid.

This attitude does not necessarily derive wholly from the refugees' present situation. Strotzka,[10] in a close study of the Hungarian refugees, found two prevalent features. First, some had crossed the border with minds occupied by wishful thinking about what they would find beyond: miraculously this act was to end their difficulties. Secondly, some had a guilt-feeling about leaving home, akin to that of a deserter. Similar emotions may partly account for behavioural disorders in other "new" refugees.

The severity of the paranoia seems to vary from camp to camp: some camps have a much more oppressive

atmosphere than others. (On the whole the farther south one goes in Europe the lighter is the atmosphere—perhaps because the southern peoples are more easy-going.) Obviously a main factor is the constitution of the group: one composed of people who have just arrived and are soon to emigrate will have a better atmosphere than one containing people who have lived long in the camp and have no hope of a solution. But other factors operate—for example, the attitude of the officials and the enthusiasm of the social and other workers.

Opinion is divided on the advisability of social workers being drawn from the ranks of former refugees. In some parts this is the practice, and the results seem satisfactory, the worker having insight into the refugee's attitude. On the other hand there is a risk of either over-identification with, or aggression towards, the refugees.

In a camp refugees have a corporate spirit, though not necessarily a healthy one; and this is reflected in toleration of behavioural disorders among their members. One cheering feature cannot fail to startle the visitor: the children mostly look healthy and happy, and talk readily enough to any who engage their attention. A possible reason is that, through propinquity, a closer mother-child relation is set up than is usual in more spacious surroundings. Children, it has been found, recover quickly from any ill effects of camp life, and through friendships at school they educate their parents in local ways; thus adults with children become fully integrated more quickly than the childless. For this reason it is especially regrettable that there are still some schools for the children of refugees only.

Protracted camp life can undoubtedly leave a mark; but Dr. Hans Strotzka,[11] who has long experience, insists that behavioural disorders evaporate more completely and quickly when refugees move to reasonable surroundings than when an ordinary group of people are moved from slums to new estates. He finds refugees highly responsive to their environment.

SOME SPECIAL SCHEMES

Besides schemes for mass emigration of the healthy, special schemes for a limited number of the less fit have been applied from time to time.

Before the start of the World Refugee Year last summer, Sweden, Norway, and Denmark accepted groups in which individuals or members of families had active tuberculosis. Sweden also took some of the "post-tuberculous", and since 1954 it has taken more than 2300 "hard-core" cases. Belgium, Switzerland, and Luxembourg gave refuge to a few

10. Strotzka, H. *in* Die psychohygienische Betreuung ungarischer Neuflüchtlinge in Österreich 1956–58 (edited by H. Hoff and H. Strotzka); p. 9. Vienna, 1958.

11. Personal communication. Dr. Strotzka is surveying the mental state of refugees in Europe. The United Kingdom World Refugee Year Committee has guaranteed to meet the initial cost.

mentally disabled patients. Refugees have been accepted also by France and the Netherlands.

So far in the World Refugee Year, Canada has accepted 100 families with one tuberculous member, and Sweden 50 and Norway 15 families with handicapped members. The United Kingdom has arranged to admit 200 handicapped; and it is sending a mission to select more—the total this time may be considerably greater than 200, and the conditions more liberal. Sweden is at present arranging to accept 50 families that include amputees or people crippled in other ways, and is provisionally arranging to accept a further 50 tuberculous families. New Zealand has agreed to accept 70 handicapped families (including 20 from the European refugees in the Far East). Australia is undertaking a pilot scheme on the same lines.

Some unofficial schemes, such as the Ockenden Venture, whereby children have been brought to this country, and a community plan in Sardinia, have proved highly successful.

In Sardinia a community, financed in the first place largely by Mr. Don Murray, a film actor, was set up for the reablement of " hard-core " people, including alcoholics. The aim is to make this community self-sufficient. Its members help to build their own houses, and otherwise engage in agriculture and chicken-farming. Members of the Brethren Service Committee, a U.S. religious body, live in the community, which at present comprises 14 families: the proposed total is 25. U.N.H.C.R. contributes 1 million lire for each family which establishes itself—and the great majority do, only a few failing and returning to the mainland. The scheme has the support of the Italian Government, which seeks to develop this formerly malarial island.

THE NEXT ROUND

This report is admittedly fragmentary: the scattered facts it contains resemble a few tiny slices from a large apple—the slices, however closely scrutinised, give little idea of the state of other parts of the apple, or of the size and condition of the apple as a whole. Nevertheless, from such facts as have been gathered, and from instructive discussions with many people, a few conclusions can be reached.

MASS EMIGRATION

The mass-emigration schemes are applied mainly in the interest of the recipient country, which rejects families containing one or more disabled members.

One family could not emigrate because the wife was myopic; another because one child had unilateral vision; a third because one of two children was deaf and dumb; and a fourth because the husband's mother was blind.

Such examples are readily multiplied. If each country relaxed its immigration laws to the extent of accepting families with handicapped members which could be expected to support themselves, that would be one step forward. The existing laws give rise to tension, uncertainty, and distress in those who must decide whether part of their family shall emigrate and the rest remain. These laws are, moreover, out of date. The insistence on freedom from suspicion of pulmonary tuberculosis derives from a bygone age: today tuberculosis can be regarded as a curable disease.

The U.S.A., Australia, Canada, and the United Kingdom have partly relaxed their immigration laws in order to keep families together. Other countries could do likewise with little risk of trouble or expense to themselves.

In the U.S.A. medical standards for refugees are the same as for others. Exclusion of the tuberculous applies to aliens " afflicted with tuberculosis in any form ". Under temporary legislation, adopted in 1957,[12] and extended in 1959,[13] this exclusion is waived for parents, spouses, and children of U.S. citizens or of aliens who either have been admitted for permanent residence or have received an immigrant visa, provided satisfactory arrangements are made for medical care and supervision and for the support of the handicapped person. In 1961 Congress will review experience and consider further extension. At the end of last year, 2511 persons with tuberculosis had been admitted under this provision. Where the disease is shown to be inactive, history of tuberculosis is not a ground for exclusion. The only ground for exclusion on the basis of history alone is " one or more attacks of insanity ". People in excludable medical categories may be admitted under discretionary provisions for medical treatment, or may be paroled under conditions prescribed by the Attorney General. The parole provision was applied to most of the Hungarian refugees who entered the U.S.A. in 1956–57; later legislation changed the parole status to that of permanent resident for those qualifying after at least two years in the U.S.A.

12. Public Law 85–316; 85th Congress, S. 2792; Sept. 11, 1957.
13. Public Law 86–253; 86th Congress, H.R. 6118; Sept. 9, 1959.

SPECIAL SCHEMES

In the planning and execution of special schemes for emigration the Scandinavian countries have played a leading part. If, as must be hoped, these schemes are to be multiplied, the criteria for inclusion might be made less rigid.

Under one scheme for the tuberculous, the conditions were that the affected person must be, not single, but a member of a family, that not more than one member of the family must be affected, and that the family must have *no* sponsor in the recipient country. These three requirements excluded most applicants; the quota was not easily filled; and disappointment was caused to those who failed on one or another of the scores.

The special schemes seldom cater for that promising group—the " post-tuberculous " (Sweden and the United Kingdom have accepted a few). It must seem a mad world to those—and they are many—who are rejected for mass-emigration schemes because they have a fibrosed lung lesion and for special emigration schemes because they do not have active tuberculosis.

THE HARD CORE

Of those who have not hitherto been included in any emigration schemes, the ageing and aged, the " unaccompanied " mothers, and some of the so-called criminals are in special need of help and acceptance.

In one or two of the first countries of asylum only manual work is to be had; and the over-40s who are unfit for this can look forward only to eking out the years until they qualify for an old people's home. In at least one country such homes are wretched places, without privacy, comfort, or sympathy.

The unaccompanied mothers (of whom a few have been accepted by Sweden and the United Kingdom) need help, first on the humanitarian ground that without a husband they are at a disadvantage in rearing their children, and secondly for the social reason that a new generation of Stateless people in Europe should be avoided. If they became pregnant while they were unmarried refugees, that is no token of promiscuity. " Having babies," said one worker, " is a camp disease."

Some " criminals " must be convinced that all hands are turned against them. Who shall say that a man whose only penal record is a short sentence in 1946 for insulting a German official is necessarily unworthy of citizenship? Yet no country has wanted him.

The United Kingdom, it seems, now denies entry only to habitual criminals. In the U.S.A. an alien " who is excludable because of the conviction of a misdemeanour classifiable as a petty offense . . . by reason of the punishment actually imposed " may now be admitted.[14]

14. Immigration and Nationality Act; p. 25. Washington: Government Printing Office, 1958.

The " hard core " are not necessarily a burden on the country where they settle: in Norway 95% of this group are self-supporting.

ORGANISATION

In the exodus from Hungary no fewer than 85 organisations contributed to the care and movement of the refugees. In Europe today the number is smaller, but it is still great enough to cause confusion and delay. In Germany, particularly, the need for a central organisation was repeatedly emphasised. Yet this unity is unlikely to be easily achieved because some agencies, though staffed by dedicated workers, are jealous of their independence and of the numbers in their care (the sums payable from official funds are related to these numbers). As it is, registration with two or even three different agencies is not uncommon.

The unhealthy and unfruitful competition in refugee work, though possibly inevitable, might be abated by bringing together at one place and at one time all concerned with the well-being of the refugee—the representatives of international, national, and voluntary organisations.

Each new refugee might be directed to a central depot, where he would be examined by an independent doctor and have his chest X-rayed. If the refugee wanted to emigrate under a mass scheme but the X-ray showed evidence of changes likely to preclude this, he could be told; and, if he disbelieved what he was told, he could go to the mission doctor, in the same building, with the radiograph. If he failed here and with other missions, he might be advised to seek entry into, say, Sweden, under a special scheme. Deciding, instead, to stay in the first country of asylum, he would go to the representative of the labour office, in the same or a nearby building, who could tell him at once the prospects of employment in his trade. The doctors, working close to the voluntary agencies, could inform the relevant agency without delay of what was needed medically to fit a refugee for work in the same country or for acceptance abroad—perhaps a pair of spectacles a prosthesis, or a fairly small operation.

Such a scheme would involve no added expense beyond the cost of the refugee travelling to and from the centre. By bringing together all resources at the same time, it would enable the refugee to decide in one or two days (instead of, as in some instances at present, one or two years) where he should go and what he was to do; and it would help to bring to light the " best " solution and not just " a " solution.

The liaison between the medical side and the voluntary agencies seems to be particularly defective. A sturdy man who was fit but had years ago had an amputation at the wrist was lately accepted under a special emigration scheme after having done not a day's work in his fifteen years as a refugee. A prosthesis would almost certainly have made this long period less barren of work and hope.

" Emigration processing centres " have already been established at Latina in Italy and at Salzburg in Austria. Central " processing " might also usefully be applied to those who have been in the first country of asylum for some time without being integrated. But any such scheme can be instituted only with the support—and perhaps at the behest—of the national Government.

THE UNITED KINGDOM'S PART

The greatest immediate needs in Europe are, first, for more money and, secondly, for further skilled social workers and integration counsellors to ensure that the money is well spent.

Not many declare that they wish to settle in this country. The quota for 2000 fit immigrants to the United Kingdom, under a scheme started in 1953, was filled only last year. Of 1467 " new " Hungarian refugees in Austria who were asked to name their country of first choice, only 17 named Britain. (The favourites were the U.S.A., Australia, Canada, Germany, Sweden, and South Africa, in that order.) But any such list, as has been said, is misleading. If the same 1467 had been told: " You may go to settle in the United Kingdom on Tuesday week ", many more than 17 would have eagerly accepted. To the refugee abstractions mean little: only specific offers bring to light what he is willing to do.

As has already been mentioned, the number of handicapped admitted to this country is likely soon to be increased substantially.[15] Two groups who deserve special attention are the tuberculous, and the post-tuberculous who are at present mostly barred from emigrating to Australia or Canada under mass schemes. (Some, in whom the disease had been quiescent for at least two years, were admitted to the United Kingdom under the " 2000 " scheme, and under the " 200 " scheme a few patients with active tuberculosis have been selected.)

The United Kingdom might offer to accept the " post-tuberculosis ", and their families, on the understanding, reached with the two Commonwealth Governments, that if further investigation should confirm that the chest condition was satisfactory, or if the condition was made satisfactory by treatment, they would be accepted by one or other of these countries. A few would, despite treatment, fail in the end to satisfy the requirements of these countries—a risk which would have to be made clear to the families concerned. This country should surely be willing to give asylum to these few. Many more would be enabled to settle in the country of their choice.

Such an effort by the United Kingdom would be a small practical step towards relieving the overburdened first countries of asylum. Other possible measures are discussed in a leading article on p. 475 of this issue.

Many have cheerfully set aside their own work for minutes, hours, or even days to supply information for this review. We are especially indebted to the following:

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In Geneva: Dr. Hans Strotzka, mental health adviser to U.N.H.C.R.; Dr. K. G. Watson, chief medical officer, I.C.E.M.

In Rome: Dr. E. Schlatter, representative in Italy of U.N.H.C.R.; Dr. G. B. Watkins, of I.C.E.M.

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In Bonn: Mrs. S. Lennox, of U.N.H.C.R.

None of the errors in this account, and none of the opinions (except where these are specifically ascribed), should be associated with those named here.

The illustrations are by Juliet Pannett, S.G.A.

Copies of this article (1s. each) may be obtained from The Lancet, 7, Adam Street, London, W.C.2. All money received in this way will be sent to the United Kingdom World Refugee Year Committee.

15. See *Lancet*, Feb. 13, 1960, p. 393.

In England Now

A Running Commentary by Peripatetic Correspondents

AFTER addressing envelopes for several hundred reprints I have been impressed by the length of the American addresses. This is the kind of thing I have been writing most of the day:

Waldo P. Whattamouthful, Junior, M.D.,
(Director of Polysyllabics) #4231,
The Medico-Psycho-Idiopathic Centre,
Bureau of University Medical Services,
The Croesus L. Goldendough Memorial Foundation,
The University of North Jabberwocky,
1234, East 49th Parallel Street,
Jabberwocky City, 23,
State of Louis Carrolina, U.S.A.

But every now and then my cramped writing hand gets a chance to recover when I write an English address:

B. Brief, Esq., M.D.,
Barts Hospital.

* * *

Here I and sorrows sit: Here is my throne, bid kings come bow to it. That was the gist of Connie's reply to our public-convenience cleaner. He is a mild inoffensive little man, with a half apologetic air, as indeed befits the duty of his calling upon both sides of the island refuge in our market square. Constance is made of sterner stuff and knows her rights down to the last pennyworth: she behaves like the dowager queen of a far-flung realm. But she will insist on spending her nights in our public convenience. We would not mind if she just curled up quietly to roost in the end cubicle: we would leave the door ajar and lay at her disposal the full range of our social service. Constance has her own ideas about community care, she has money of her own in the purse beneath her skirt, she has travelled the world and still likes England best. She must be nearly seventy and she is fond of fish and chips. The trouble is that fish and chips are wrapped in newspaper, and newspaper is as tough as Connie. If we have had to rod that drain once we must have done it twenty times.

When she came into winter quarters with us last year she was willing to live and let live; but, like the permanent residents in a guest-house, she has become over-possessive and almost proprietorial. The electric light bothers her eyes in the evening, so she climbs up and removes the bulb. Our other guests have to fumble their urgent way with matches or a torch, and then Connie puts on a deep gruff voice and startles them out of their wits with a torrent of words that are usually only written in such places. We get indignant demands for money back next day, and wild accusations about the morals of our town. Once tucked in for the night Connie will not come out. We called the police. One of our new policewomen tried chirping through the door for ten minutes, and then went back for the sergeant. He brought a scaling ladder and had the advantage of a face-to-face discussion across the cistern. Constance rested her case upon the common law of England. As one of the public, she found it a great personal convenience to enjoy in the fullest sense the unlimited value of what she had paid the proper price for. The police retired defeated and said it was our pigeon. The cleaner suggested squirting his hosepipe underneath the door, but luckily I phoned the Town Clerk first. He mumbled something about assaulting an invitee and advised against it. So Constance, flushed with success, remains our paying guest. She says she is thinking of moving at Whitsuntide to one of the seaside towns. The cost of living remains the same wherever she goes: no bother about hotel bookings. England is her realm, and she seems enthroned for life.

* * *

Down the corridor I have a neighbour who, I suspect, has lost half his colon, like me, and is enduring the rigours of cloacal rehabilitation. We share the services of a one-nurse-power 1959 model tubular-framed wheeled bedpan carrier whose reassuring presence in the room is replaced by a sense of grievous need when he wins it from me. I suppose he feels the same. The red banner permanently placed over the bedpan seems to be of historic significance, I suppose the vehicle was not covered by the Act of Parliament which replaced the famous "Red Flag Act". Incidentally no bell, siren, or hooter is fitted, all warning noises being provided by the driver. This feature is not even to be found in the annual veterans' trip from London to Brighton.

* * *

Veterinary surgeons attempting to medicate rhinoceroses meet high consumer-resistance, because their patients, though well down the list of potential passengers in lunar probes and similar rocket-propelled television sets, have lamentably little confidence in the progress of science. This unhealthy attitude of mind has been countered at the San Diego Zoo by a vet who uses a rifle and plugs the intransigent reactionaries with medicated bullets.

The reluctance of rhinoceroses to swallow strange chemicals is in awesome contrast with the habits of that Lord of Creation and Nature's Noblest Work, *Homo sapiens*, who pours such substances down his gullet like coal down a chute. If threatened with medicinal bullets, he would probably charge the guns in the manner of an ecstatic Fuzzy-wuzzy storming a British square.

Nevertheless, for the G.P., though his visiting-list makes him feel more like shooting himself than his patients, but only just, missile therapy could hold certain attractions. Sitting happily at the butts in his consulting-room, the patients would be propelled from a trap across the room and out through the front door. The really pukka practitioner would of course not fire until he could see the whites of their gluteus maximus, and unsporting habits like potting the sitting clients would be anatomically impossible.

Invitations to colleagues to come over and shoot—"Make it a Monday, easily the best day. I've 1500 brace on my list"—would be eagerly sought after. Going on safari after patients, and "sitting up" for the craftier varieties in trees under which has been tethered a 16-oz. bottle of tonic, offer interesting possibilities; and how expeditiously one could empty a crowded waiting-room by loading with every pill in the sample-drawer, hurling open the door, and administering what in Nelson's day was known as "a whiff of grape".

* * *

We were prepared to think that our children believed that all human activity centred around hospitals, just as Daddy's did, but we did not realise that the belief extended to the animal world. We were on our first holiday in Australia and walking along a red dirt road listening to the new bird songs. Suddenly we came across a large lizard lying inert in the sand with its head obviously crushed by a passing tyre. Jan, aged three, said accusingly, "That poor lizard is dead, Daddy. You must have run over him with the car." We denied this, but the inquisition continued. "Was it a Mummy lizard or a Daddy lizard?" Empirically we declare it male. "Why did he get run over, Daddy?" Here we offer some propaganda for road drill. "He could not have looked both ways before he crossed the road." "Why did he not look both ways before he crossed the road?" Desperate now—we groan, "Perhaps he was hurrying home from work." "What hospital did that lizard work at, Daddy?"

* * *

Civil Service Glossary for newcomers to the National Health Service.

"The position is fluid."—Everything is in a dreadful mess.

"The position is being carefully watched."—Nothing whatever is being done.

"The matter is not yet finalised."—Nothing has even been started, although there's a lot down on paper.

"A small committee is being appointed to look into the matter."—We're hoping this will keep everyone quiet for a year or two.

"Please clarify your remarks."—You are expected to use plain English, even if we don't have to.

"Constructive criticism is welcomed."—We're not interested in any of your silly ideas.

* * *

REQUIEM

Alas! Poor Spens beyond our range
To Limbo has been sent.
We swore that we would take no change.
But now our Spens is Spent.

Letters to the Editor

PRIVATE PATIENTS IN THE NATIONAL SCHEME

SIR,—Your views on the subject of drugs for private patients seem strangely confused. Having stated that "within the National Health Service, medical privileges cannot be bought" you add "The apparent exception—the private bed in a hospital—is not really an exception at all: the patient in a pay-bed is paying at least the full cost of his treatment". Perhaps one may ask why you have omitted that other exception, the amenity bed, in which privileges are "bought" at considerably less than cost price.

You aver that the doctor's time and convenience of access to him are an important part of good personal care and that *the commonest criticism of N.H.S. general practice is that it fails to provide these things* (my italics). You then go on to state that such medical care should be "provided . . . not sold". But surely all medical care, whether secured privately or by compulsory insurance and taxation, is "bought" and, by the same token, "sold". Following these confused imputations about buying and selling you go on to suggest that the private doctor is "selling care of a higher standard". If this be so (and if *The Lancet* is really interested in high medical standards as opposed to budgetary semantics) then surely it is to be encouraged.

A lot of rubbish has been talked about *two* standards of medical care (chiefly emanating from the Socialists and echoed by the Cohen Committee) when there are manifestly many different standards both in State and private practice. Good State Medicine may be better than bad private practice, but good private doctoring tends to be better than most State doctoring for good Medicine takes time and time costs money. If the State is unwilling or unable to provide the G.P. with more money and proper incentives then any sane Government should be grateful that some patients are keen and willing to do this themselves. Despite all the impediments placed in their way many patients do, to their credit, prefer to exercise some measure of personal responsibility for their medical care. To help those who are thus prepared to help themselves seems both sound finance and sound philosophy.

You, Sir, seem concerned that higher standards in private practice will show up some of the defects of N.H.S. doctoring. Far from this giving anyone, as you suggest, a vested interest in preserving the defects of the N.H.S. (and defects exist in private practice too) it must surely encourage higher standards all round. Certain it is that improvements in the conditions of N.H.S. practice are more likely to come about if capitation-fee Medicine has to stand up to lively competition from private practice. The present near-monopoly by the State is surely contrary to the best interests of British Medicine.

London, W.1. REGINALD S. MURLEY.

SIR,—The argument that a fee-for-service system of payment is anathema to the N.H.S. seems unreasonable. It already exists for obstetrical work, domiciliary consultations, and the use of an electrocardiograph. It seems a pity to reason the case from false premises.

I fear "two standards of care" are already firmly built into the N.H.S., so long as the conscientious doctor is financially poorer by the more care and attention he gives his patients.

He has the choice of being financially solvent with an uneasy medical conscience, or financially straitened with a clear medical conscience. I think most doctors actually working a practice will agree with this unpalatable fact, ignored by administrators and politicians.

Burley, near Ringwood, Hampshire. R. HOWARD.

SIR,—You rightly stress in your editorial note on last week's letters that the amenities of the ordinary list should be improved. But would you not agree that it would be reasonable for the occasional patient to pay a fee for the privilege of being seen in his own home, or under conditions of greater comfort and privacy, for any minor disorder for which he might otherwise be expected to attend the surgery?

Workington. R. N. R. GRANT.

SIR,—As a private practitioner I already make use on behalf of my patients of the consultant, radiological, pathological, and other specialist services provided by the State at their expense, and my signature suffices to secure them the sick benefit, maternity grants, and so on to which they may be entitled; I cannot, therefore, follow the reasoning in your annotation of Feb. 13, that to obtain their medicaments for them from the same source, and to undertake to conform with the modest standards of economy and propriety in prescribing expected of doctors in the N.H.S., would introduce an entirely new relationship with the latter, and involve, as you put it, entering the Health Scheme.

Furthermore, Sir, even were you correct in crediting me with a secret desire to perpetuate "the defects of ordinary medical care", I find it extremely difficult to conceive what practical measures I could possibly take to further this deplorable purpose. If the State can find the incentives to provide within the N.H.S. the standards of care for which at present patients turn to private doctors, no doubt private practice will disappear, but until that has happened, to hamper it by unfair discrimination, or to abolish it altogether, which would seem to be the logical conclusion of the views put forward in your annotation, would do nothing to encourage "a vested interest in getting rid of the defects in ordinary medical care", but would merely destroy the yardstick by which its quality could be assessed.

Richmond Green, Surrey. IAN FERGUSSON.

POLIOMYELITIS RISK TO EUROPEANS IN THE TROPICS

SIR,—Professor Scarborough's letter last week on the risk of paralytic poliomyelitis to visitors to Nigeria is too limited in its scope. Our teaching in this hospital has always stressed the supreme importance of paralytic poliomyelitis in Europeans in tropical climates.

It is generally recognised that since the introduction of proguanil ('Paludrine'), the greatest risk to which the European is exposed anywhere in the tropics is paralytic poliomyelitis. There can be few of us with much experience in the tropics who have not lost friends, relations, or colleagues from that malady.

The Services, the Colonial, Foreign, and Commonwealth Relations Offices have for some time past provided inoculations with subsequent booster doses for all personnel and their families in tropical countries from the exiguous supplies of vaccine available.

Missions and commercial firms have been helped to the limit of our capacity in the past 2 years.

Fortunately the improved supply position does away with the hitherto invidious task of refusing the vaccine to deserving travellers without a "permit" and enables all who are going to the tropics—even on a short visit—to receive this most necessary inoculation.

Hospital for Tropical Diseases, University College Hospital, London, W.C.1. GEORGE R. MCROBERT.

AUTOTRANSFUSION IN RUPTURED ECTOPIC GESTATION

SIR,—Dr. de Glanville (Feb. 13) need have no fear that blood shed into the abdominal cavity from a ruptured ectopic gestation rapidly acquires poisonous properties making it unsuitable for autotransfusion. In many of the cases referred to in my previous letter (Jan. 2) the blood had already been shed two, three, or more days before the operation; moreover, as is well known, there are often episodes of slight bleeding over a week or more before the final heavy hæmorrhage takes place.

When I stated "Naturally, only recently shed blood is suitable; . . . the method is less applicable, but is also less necessary, when intra-abdominal bleeding has already been present for several days", I was referring to the practical difficulty of collecting *fluid* blood as distinct from blood clot.

The second part of Dr. de Glanville's letter is sadly reminiscent of the fable of the Fox and the Grapes: because he does not like the idea of autotransfusion (at least, after 10 hours), he takes refuge in the supposition that blood-transfusion does not matter. Doubtless, there are many patients—even those seriously ill—who do recover without transfusion; but can anyone seriously contend that a pulseless, collapsed woman with two or more pints of blood free in the abdominal cavity is not, in many instances, saved by blood-transfusion, or that her convalescence is not greatly hastened by bringing her hæmoglobin back to normal levels? And in West Africa, where Dr. de Glanville has worked, the patient's need may be even greater, for malnutrition, malaria, or hookworm disease may have brought her to a serious degree of anæmia before the pregnancy started.

It is because autotransfusion is, curiously, so often regarded with incredulity that I feel it a duty to demonstrate the method to my students who may, in time to come, practise in regions where blood-banks are unknown. I bear with fortitude their remark that, being a Scotsman, I cannot endure seeing blood wasted.

The Radcliffe Infirmary, Oxford. J. CHASSAR MOIR.

COST OF DRUG TREATMENT

SIR,—I should like to comment on Dr. Miller and Dr. Smith's statement, in their article of Jan. 2, that "rather more than three-quarters of all National Health Service prescriptions are for tablets, *the dispensing of which does not call for any high degree of professional skill*" (my italics).

It is, of course, well known that practical pharmaceutical skill has to a great extent moved away from the retailer into the factory, but this does not mean that the retail pharmacist is for ever relegated to the lowly position of a counter of "ethical" pills and tablets. Far from it, because, as Sir Hugh Linstead has so rightly stated, "Here indeed is the modern role of the pharmacist to keep abreast of the new wealth that pours from our research laboratories."

The rapidly rising standard of pharmaceutical education today, with its emphasis on pharmaceutical chemistry, pharmacology, and therapeutics, is equipping the pharmacist for his true professional role—that of a recognised authority on the chemistry, actions, and uses of new drugs. New medical products are becoming increasingly complex both in their chemistry and usage. There will, therefore, be greater need than ever, in the years ahead, for knowledgable pharmacists in retail practice and in hospitals to make a detailed study of new drugs and to make this knowledge available to the medical profession, to help them choose the best therapeutic agent once a diagnosis has been made. I am certain that there are, even today, many retail and hospital pharmacists who are living up to the highest professional standards in providing just such a service.

The pharmacist of tomorrow will be even better equipped to render this service, and I feel that Dr. Miller and Dr. Smith are doing a great disservice to their own profession as well as to pharmacists in general by giving the impression that there is no more to pharmacy than the counting of N.H.S. tablets. Even in the dispensing of tablets the vigilant pharmacist uses a great deal of professional knowledge, for he is the last line of defence between the patient and the wrongly written prescription, of which there are perhaps more than the medical profession are prepared to admit. Unfortunately one seldom hears of this important aspect of the pharmacist's work, but it is one which will undoubtedly become even more important and necessary as drugs become more and more potent and specific in their actions and hence more dangerous if prescribed or dispensed wrongly.

Evans Medical (Northern Ireland) Ltd., Belfast. A. N. MORRISON General Manager.

TRIAL OF ORAL CONTRACEPTIVES

SIR,—The appeal for volunteers for a trial of oral contraceptives (the Pincus pill) in Birmingham recently has resulted in a spate of letters from doctors all over the country asking for further particulars about the pill and its use. May I through your columns give an outline of the pill, the present position, and the future possibilities?

There are a number of orally active progestational steroids now available. In addition to their uses in endometriosis, menorrhagia, subfertility, &c., they can be administered in such a way as to inhibit ovulation. One of them, norethynodrel, has been used extensively first by Pincus and his colleagues in Puerto Rico and since then by Tyler and others.

Three such compounds are being used for clinical trial in this country:

'Enavid' (Searle) norethynodrel + added œstrogen	5–10 mg.
'Secrosterone' (B.D.H.) dimethisterone	20 mg.
'N.E.A.' (Schering) 19-norethisterone acetate ..	5 mg.

These steroids inhibit ovulation. There is an associated endometrial effect and hostility of the ovulatory cervical mucus, which may also have contraceptive value. Experts are agreed that the investigations so far carried out indicate: (*a*) administration of these pills for three or four years is harmless; (*b*) there is no decrease in subsequent fertility; fertility is restored to normal, or even improved, as soon as the administration is stopped; (*c*) they are not carcinogenic.

Further studies are essential to find out the long-term effects and the effects on the menopausal woman (as withdrawal bleeding takes place each treatment month, the normal amenorrhœa of the menopause is masked: it is believed, however, that the menopause is not postponed and that the decrease in primordial follicles with age is not affected by administration of these steroids).

Small trials under the auspices of the Council for the Investigation of Fertility Control have been undertaken in this country in the past year. The new trial launched in Birmingham is the third. Very careful medical supervision with endometrial biopsies, postcoital tests, &c., where indicated, are used in these trials for research purposes.

Although these steroids are harmless, a number of patients drop out because of unpleasant side-effects, notably nausea, headaches, and upset in the menstrual rhythm. Close and constant medical supervision is necessary to ensure that this irregularity is dealt with in the proper way, otherwise there might be breakthrough ovulation.

The pills are administered in the doses given above (though smaller doses are now being tried) daily from the 5th day of the menstrual cycle for 20 days. This will normally be followed by a withdrawal bleeding. If breakthrough bleeding occurs (that is, during administration) it seems best to stop and allow a withdrawal bleeding, regard it as an early menstrual period, and commence administration again on the 5th day for 20 days. If menstruation is delayed beyond 8 days after the drug is finished, it must be given again as if menstrual bleeding has occurred. Very often, though there are irregularities in

the first three months of administration, these settle down thereafter. In the same way, nausea may be present for the first few days, but may then disappear spontaneously and completely.

These difficulties, plus the present expense and the fact that the tablets must be taken regularly or bleeding occurs, or fertility may increase, mean that they are not really suitable for prescribing at present. They seem to be reasonably efficient if taken faithfully. Pincus' investigations gave an all-over efficiency of 70%, but he claims that only one pregnancy occurred among those women who had taken the pills exactly as directed.

While the development of these steroids as oral contraceptives is a most interesting step forward in the search for simpler contraceptives, it seems at present that they are not what we are all looking for: something much simpler, much less expensive, and preferably with a chemical and not a hormonal action, would be preferable if it is to be used on a large scale to deal with the enormous problem of rapidly expanding population in underdeveloped countries.

May I make it clear that these trials are quite separate from the normal working of the Family Planning Association clinics. Patients who attend F.P.A. clinics will continue to receive advice on maximum safety methods of contraception.

ELEANOR MEARS
Medical Secretary, Family Planning Association;
Medical Secretary, Council for the Investigation of Fertility Control.
London, S.W.1.

WHAT IS A TRANQUILLISER?

SIR,—May I propose that we adopt the following definition of the word "tranquilliser"?

"A tranquilliser is a drug produced to compete commercially with chlorpromazine; which has no unequivocal therapeutic efficacy; which aggravates the risk of suicide by its depressant action or creates the risk of addiction by its euphoriant effect; and which, by masking the signs, tends to interfere with the recognition of early psychotic states."

Hartwood Mental Hospital,
Shotts, Lanarkshire. L. N. COOK.

FATALITIES AND SPORT

SIR,—Dr. Taylor (Feb. 20) is teasing you. This would doubtless be amusing were it not for the possibility that some of your readers, who perhaps have not been following the argument, might be deceived into thinking that he really means what he says.

From ancient days it has been accepted by the common law of England that it is not the act itself, but the wrongful intention that prompts it, which determines whether or not blame may be laid upon the doer. The law also presumes that a reasonable man must be taken to intend the natural and probable results of his actions. Both these are in accordance with common sense and the usages of civilised communities.

In every sport except boxing injury is accidental in the sense that it is sustained against the rules or in spite of them. In boxing the avowed intention is to produce injury, and having done so, to exploit it until the injured man is effectively defeated, The London Amateur Boxing Association's recent handbook, *Medical Aspects of Amateur Boxing*, is commendably frank in this regard. On p. 12 it is stated without equivocation that "Injury to the cranium and its contents is a direct product of boxing and *not an accident as in all other sports*". (Italics not original.) An act does not have to be unlawful before it can be recognised as totally unjustifiable.

Of course a death in any sport is to be deplored. But an accidental death in the course of a game of rugby football is rather a different matter from a death in the boxing ring. The rules of rugby do not condone deliberate injury; the rules of boxing facilitate, and are designed to produce, deliberate injury. That is why many of us think that boxing should be prohibited whilst not in any way wishing to interfere with other sports. There is no inconsistency here.

It is true that some people evidently find it difficult to grasp the underlying principle. This places a special responsibility on us all not to create confusion in their minds on purpose.

Godalming. J. A. WAYCOTT.

SIR,—In rugby football injury is accidental. In boxing it is deliberate.

London, S.E.5. F. B. BYROM.

CASUALTIES AND CASUALS

SIR,—I am in complete agreement with Dr. Doyne Bell (Jan. 30) that casualty departments should be renamed "accident and emergency departments".

At the North Lonsdale Hospital, Barrow-in-Furness, and at Preston Royal Infirmary, the cases dealt with in the casualty departments are restricted. Both hospitals contend that "consultation and treatment in this department are intended for (1) recent accidents, (2) urgent cases of collapse, &c., and patients referred from their own doctor by letter." (There are notices to this effect outside each department).

In Barrow we include under recent accidents those which occur after the general practitioners' evening surgery and who attend hospital up to 10 A.M. the following day. If the patient has been sent by his own doctor with a condition that is not urgent, he is referred to the next appropriate outpatient clinic.

Patients who do not come into the above categories are referred to their own doctor with a printed letter stating that the case is not considered an emergency. Exceptions are made for patients who would suffer hardship by doing so, and for all eye cases. During the day the "sorting" is carried out by the clerk in charge of the casualty records with advice from the casualty officer.

The age-distribution and sources of new patients are similar to Dr. Fry's series but a comparison of diagnostic classification cannot be made without breaking down his figures still further. The only type of medical or surgical patients seen in the department are those who have collapsed at work or in the street, &c., because patients sent by a local practitioner are admitted directly to the wards concerned and *not* through casualty.

Analysing our figures we find that: 30% of casualties have wounds which require two or more sutures; 14% are limb fractures, of which half involve wrist and hand; 13% are foreign bodies in eyes; and 10% are contusions and 4% sprains. 57% of new attenders arrive within 2 hours of the accident and another 14% within 24 hours.

As a result of their first attendance 60% of patients were discharged, all of whom had been given a letter for their own doctor. 3% did not reattend when asked to do so. 7% were admitted, and the remaining 30% reattended (two-thirds of these once only). This last figure would be smaller, but a "standing order" in this hospital is that those cases not seen by the casualty officer himself must reattend to see him or the consultant in charge of the department. Half the reattenders were referred to other outpatient departments.

In support of Dr. Fry our figures show that 33% of cases seen in casualty could only have been dealt with there, but 40% could have been treated by the G.P. and 5% by a nurse only.

To save the more "regular clients" many injections of A.T.S. and the wait thereafter, all those given A.T.S. are recalled 6 weeks later for tetanus-toxoid immunisation. The aim is to immunise the local working community and children. 80% of these patients do attend for the course and since the scheme started two years ago [1] over 2000 have been immunised (more detailed figures will be published soon).

This casualty department is staffed by a casualty officer, who is also the orthopædic registrar, and in his absence, by the house staff, though he is available if required. There is a

1. See *Lancet*, 1958, i, 1176.

consultant orthopædic surgeon in charge, who does four 1-hour sessions a week in the department reviewing certain cases, including some of the fractures.

General practitioners have direct access to the X-ray department, but perhaps do not use this facility to the fullest advantage. Those of their patients who have fractures are automatically referred to casualty by the radiologists after they have seen the wet films. As the waiting lists for outpatient appointments are not large, except in the ophthalmic department, casualty is not often used by the local doctors as a short cut to outpatient clinics.

I agree entirely with Dr. Fry on his views as to the future of the casualty department. The number seen has increased and the main reasons are probably (*a*) there is a 24-hour service; (*b*) there seems to be a general belief amongst the public that even the most trivial injury should receive hospital attention; (*c*) the attitude "we pay for it so let us have our money's worth". Most of us who were children before the war would never have been sent to the hospital or even to our doctor with the minor trauma which today is often seen in casualty departments.

North Lonsdale Hospital,
Barrow-in-Furness. P. A. GARDNER.

INFANTILE STRUCTURAL SCOLIOSIS

SIR,—Mr. Denis Browne (Feb. 13) criticised the incompleteness of your annotation of Jan. 30. I should like to support your main point—that further knowledge of the ætiology of this condition is the most essential requirement for improvement in methods of treatment.

It might perhaps have been worth mentioning that 80% of infants have a lateral curve of 10° or more at 6 months, 46% at 12 months, and 7% at 18 months, the normal stimulus of assuming the erect posture apparently being the factor leading to correction of this type of curve.[1] The existence of a resolving type of structural infantile idiopathic scoliosis, as distinct from the progressive variety, was first described in a paper published in 1955.[2] Further evidence has more recently been published of resolution in older children,[3] and discovery of the cause of resolution would certainly be an important advance in our knowledge of the ætiology and treatment of idiopathic scoliosis. Although Harrenstein[4] described the recovery of a limited number of very young patients with lateral curvature of the spine he, as others have done, attributed it to a form of treatment.

Those interested in the subject would be grateful to Mr. Denis Browne for producing any evidence that progressive infantile scoliosis can be cured in early infancy by "splinting and physiotherapy".

Nuffield Orthopædic Centre,
Headington, Oxford. J. C. SCOTT.

CATHETER DRAINAGE AND INFECTION IN ACUTE RETENTION OF URINE

SIR,—We entirely agree with Mr. Harrison (Feb. 20) in preferring the Gibbon catheter to the ordinary rubber and plastic catheters for bladder drainage.

However, the work which we reported on Feb. 6 was started before the Gibbon catheter became available, and finished more than a year ago. It had as its principal object the evaluation of closed drainage in the treatment of acute retention of urine. We wished to test the effect of preventing the ascent of contaminated air-bubbles in the drainage tube, uncomplicated by a change in the type of catheter used. For this reason, we continued to employ the latex and plastic catheters (size 18 and 20 F) which were in routine use when we began our investigation.

In the periods of up to a week or so for which our patients were drained, urethritis was not severe enough to necessitate changing the catheters and closed drainage gave excellent results, as we have shown. However, the Gibbon catheter is preferable even for short periods of drainage, and is especially preferable for longer periods. We now use it routinely, but should perhaps say that the Gibbon catheter is not suitable for draining the bladder immediately after prostatectomy. The narrow lumen is readily blocked by clot. For postoperative drainage we now employ a boilable 'Neoplex' catheter (size 22 F) in conjunction with the apparatus for closed drainage and irrigation which we described in 1958.[1]

Department of Pathology,
Bristol Royal Hospital,
Royal Infirmary Branch,
Bristol. ASHTON MILLER
W. A. GILLESPIE.

1. Scott, J. C. *Proc. R. Soc. Med.* 1956, **49**, 398.
2. Scott, J. C., Morgan, T. H. *J. Bone Jt Surg.* 1955, **37B**, 400.
3. Scott, J. C. *ibid.* 1959, **41B**, 105.
4. Harrenstein, R. J. *Rev. Orthopéd.* 1936, **23**, 289.

ANTI-SMOKING CAMPAIGN

SIR,—Thank you for the space you gave to the interesting account (Feb. 6) of the commendable anti-smoking campaign by the Edinburgh Public Health Department. Such a campaign is bound to make an impact whose value cannot be immediately assessed. But there are, I suggest, two lessons to be noted.

First, a national habit can be adequately faced only on a national scale. Edinburgh has given a noble lead. But its example has been largely offset in the minds of smokers (who are, of course, on the lookout for an excuse to continue their habit!) by the lack of such a lead elsewhere. As doctor after doctor has written to our Society to say, this thing demands a central lead and a national campaign. All honour to Edinburgh Public Health Department for their splendid local lead! But none to the Ministry of Health for the national lead they have not given!

Secondly, we are confronted with a vicious circle—or more than one. Warning boys and girls against smoking must be reinforced by parental example. But adults who are enslaved by the habit cannot give such an example. Over 4000 such adults have written to our Society pleading for help to free themselves from this slavery. But when they *have* managed to succeed, they are confronted with an environment in which smoking is still allowed in almost every public place, so that they find themselves almost forced to resume smoking in self-defence. On top of this, of course, there are the massive advertisements and vested interests ranged against us, while the anti-smoking forces are weak and impoverished.

The National Society of Non-smokers is trying to curb cancer by curbing (at every turn) what has been identified as a main factor in the increased lung-cancer mortality. We are seeking to warn society; curb smoking; deter youth; protect non-smokers; free "smoke-slaves". We shall gratefully welcome the moral and financial support of new members.

HUBERT V. LITTLE
Secretary,
National Society of Non-smokers.
138, East Dulwich Grove,
London, S.E.22.

SIR,—The conclusions of the Edinburgh investigation (Feb. 6) are what might have been expected. The position would be much the same with other drug addictions if dealt with as timidly and respectfully. Would exhortations, lectures, &c., have much effect on the use of heroin, cocaine, and opium if their manufacture, advertising, and purchase were free and uncontrolled?

It would be refreshing to see the Ministry of Health return to earlier public health traditions, when abuses were boldly dealt with. Nowadays the Ministry seems to hang back if there is any question of antagonising public ignorance and apathy, or offending powerful advertising, industrial, or other vested interests.

London, W.8. G. G. SHERRIFF.

SIR,—All such campaigns go about it the wrong way. The expected response of most people, especially the young, to statistics about the ill effects of smoking on health in middle life and old age will be "We, as a nation,

1. *Lancet*, 1958, ii, 608.

prefer to die on our feet rather than live on our knees." What is needed is subtle build-up of the non-smoker and smirching of the smoker: statements or proof that the cigarette is a substitute for a dummy or a mummy, that smokers are neurotic, dependent individuals unable to stand on their own feet without the aid of a symbol of maternal protection, while non-smokers are strong, independent, self-reliant types. I am sure such an approach would have much more success than exploitation of the fear of cancer.

Wednesbury, Staffs. H. B. BAKER.

THE ROYAL COMMISSION'S REPORT

SIR,—Your excellent leading article last week on the report of the Royal Commission states correctly that the recommendations on pay for house-officers are higher than the recommendations suggested by the British Medical Association. This is true; but to complete the story you should also mention that the Commission's rates for house-officers are lower than those suggested by the Medical Practitioners' Union.

Originally the B.M.A. proposed a flat 24% (later 29%) for all grades. In its evidence on the remuneration of hospital medical staff submitted to the Royal Commission in April, 1958, the M.P.U. drew attention to the plight of junior hospital medical staff and the Spens recommendation that "intending specialists should not be called upon to pass through a period of comparative penury". This was one of the factors that led the B.M.A. to raise the amounts suggested for registrars and house-officers. The M.P.U. submitted the same figures for consultants as those suggested by the B.M.A., but for registrars and particularly house-officers they were higher. In this respect the Royal Commission has suggested figures which are somewhere in between.

I think that it can be fairly said that the Medical Practitioners' Union has done a service to the whole profession by drawing the attention of the Royal Commission to this anomaly and with very excellent results. The B.M.A. has for the first time departed from its usual practice of serving only the vested interests of the part-time consultants. It is to be hoped that, in the discussions which lie ahead, concern for the problems of the junior grades will be maintained.

Bushey, Herts. P. WATNEY ROE.

LEISHMANIASIS ACQUIRED BY CONTAGION

SIR,—I was very interested to read Professor Symmers' paper of Jan. 16, in which he states that it is remarkable that the woman's lesion took the form of an oriental sore typical of infection by *Leishmania tropica*, whereas her husband's disease was of the visceral type associated with infection by *L. donovani*.

It has been shown [1] that the East African strain of *L. donovani* is very dermatotropic in that a primary skin lesion precedes the visceral infection. There is a latent period of commonly four to six months during which time only a skin lesion can be found. It is possible in the case described by Professor Symmers that, had the vulval lesion been allowed to continue untreated, visceral spread would have occurred and the woman would have developed kala-azar, or the nodule would have faded spontaneously as can happen in a smaller proportion of cases, without visceral spread. The husband was infected, during the early part of the East African campaign, in the Sudan Ethiopian area, where kala-azar infection is common and of the same type as is found in East Africa. In East African kala-azar parasites are found in the normal skin in up to 11% of cases, so that infection by direct contact could have occurred in this way.

King George VI Hospital, Nairobi. P. E. C. MANSON-BAHR.

1. Manson-Bahr, P. E. C., *Trans. R. Soc. Trop. Med. Hyg.* 1959, **53**, 127.

MEDICAL NEEDS OF INDIA

SIR,—I have read with great interest your leader of Jan. 30, 1960, and I should like to comment on some of the points.

India is trying through its five-year plans to raise the standard of living of its people. This is, at present, extremely low, for the average income is less than £23 per head per annum, of which food consumption alone takes 60–70%. In the first five-year plan (1951–52 to 1955–56) expenditure on agriculture, community development, flood control, &c., formed 32·1% of the total as against 5·9% on health. The provision is 20·9% on the former and 5·7% on the latter in the second five-year plan (1956–57 to 1960–61). The expenditure on industries, mining, transport, communication, and power, which had the major share, formed 42·3% and 53·3% of the total expenditure in the two plans. The total outlay of the first and second plans were Rs. 23,500 million and Rs. 48,000 million respectively. The national income increased by 18% in the first five-year plan and it is expected that it will increase by about the same proportion in the second five-year plan.

President Rajendra Prasad, when inaugurating the budget session of Parliament on Feb. 8, 1960, said that the object of the third five-year plan, the preparation of which was making good progress, would be to double the national income, taking 1950–51 as the basic level. Greater attention would be paid to agricultural production and heavy machine building as well as to development of basic resources like steel and power. The progress, though not spectacular, is steady and encouraging.

On the agricultural front the results have not been encouraging. The area of cultivated land per caput was 1·09 acres in 1891, 1·11 acres in 1921, and 0·84 acre in 1951—i.e., nearly one-fourth less in 1951 than in 1921. With the present efforts agricultural production in the second five-year plan has been averaging a 3·5% annual increase. India will require 110 million tons of food grains a year by 1965–66 when the population is expected to be 480 million, and she will have a shortage of 28 million tons of food grains if the present rate of production continues. During the past ten years India has been importing, on the average, 2·5 million tons of food grains a year, at a cost of nearly Rs. 1000 million.

Probably no single factor is so important for the future progress of India as the solution of its sudden increase in population. For India this has become the basic problem, for on its solution and balanced achievement depend all future progress. Control of famines and epidemics, and the provision of maternity and child-welfare services, are lowering mortality and increasing the span of life.

The expectation of life at birth in India in 1921–30 was 26·89 years, in 1941–50 it rose to 32 years, but in 1951–60 it is expected to be about 42 years, a gain of 10 years during the present decade. India's population between 1891 and 1920, when the natural checks were operating, increased by 12 million only, but between 1921 and 1950 it increased by 110 million.

It is estimated that India's population, which was 357 million in 1951, will have expanded to 431 million in 1961, and at present the rate of increase is 2% per annum as against 1·3% per annum in 1941–50. Medical men may be blamed for bringing about this accelerated rhythm, but no-one can deny that medicine must serve society by conquering killing diseases, preventing epidemics, promoting and restoring health, and prolonging life so that it may be lived and enjoyed to the full. But large families and disease may be responsible both for high morbidity and mortality, and population pressures and good health do not go together in countries with a low economy. Too often Indian women alternate between gestation and lactation until their premature death. The application of scientific medicine to improve the health of the people in underdeveloped countries aggravates the population problem, and as science can be used to reduce deaths it should also be used to reduce births.

The Government of India realises this fact fully, and the Indian Planning Commission clearly states in the second five-year plan that " The problem of regulating India's population from the dual standpoint of size and quality is of the utmost importance to national welfare and national planning ". The Government, therefore, is actively supporting a family planning programme and is giving it high priority. A provision of nearly Rs. 50 million has been made for this in the second plan, and 300 urban and 2000 rural clinics are being set up (by the end of 1959 there were 1147 clinics of which 712 were in the rural areas).

The Census Commissioner to the Government of India, in his report on the 1951 census, laid down a national policy by which India could attain a stationary population. This should be done by avoiding " improvident maternity "—defined as childbirth in a mother who has already given birth to three or more children, of whom one at least is alive. In order to achieve this, the people, 83% of whom live in more than 500,000 villages in India, with no privacy or toilet facilities of any kind, and who are mostly illiterate and ignorant, should have suitable and cheap means of contraception at their disposal. That is the biggest hurdle yet to be crossed in the way of family planning, and it needs serious thought and investigation by the demographers, medical men, and scientists. In my opinion, coitus interruptus appears for the present to offer itself as the most practicable method for mass adoption. Oral contraceptives which would be acceptable may take a few decades of experimentation before they can be recommended for mass adoption.

All this, Sir, may seem far removed from the subject of your leading article, but it is only fair to pay due consideration to the background against which the medical needs of India must be assessed. We, in this country, are trying to achieve results which " Western " countries have only enjoyed after perhaps a hundred and fifty years of intensive efforts. We cannot hope, nor do we want, to imitate all aspects of Western medicine, for our way of life is, and must remain, different. We do, indeed, welcome people who are prepared to come and work with us provided that they will stay sufficiently long to learn and understand the customs and habits of the country.

May I make one further comment, on your criticisms of the administrative framework. While it is true that this medical college is unique in India in that it is directly under the University, which is an autonomous body, all senior academic posts in medical colleges are, so far as I am aware, filled, like my own, after open advertisement and interview by a University Selection Board or the State Public Service Commission on which there are independent assessors or experts.

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Lucknow, India.

B. G. PRASAD.

AMINE IN SEARCH OF A FUNCTION

SIR,—Your annotation of Dec. 12 with this title seems to imply that this agent is also in search of a name. It is variously known as 5-hydroxytryptamine, 5-OH-T, 5-HT (the jazzy variant, 5-HOT has been wisely overlooked), serotonin and, in an early guise, enteramine.

The chemical names are specific to a degree but, since they begin with the strident word " five ", cacaphonous. Trivial names may properly describe functions; among these, our term " serotonin " alludes both to one of the source materials and to this amine's major effect on smooth muscle, while Erspamer's " enteramine " characterises a single, possibly physiological function. However, few are so humble as to wish to rest even their primitive central nervous activities on so gutty a base as enteramine. (The pun is intentional.) Hence, the term " serotonin " seems both defensible and useful. Lastly, it is a pity to burden medical letters, bemuse indexers, and confuse students with increasing numbers of names for the same thing, or further to separate the English and American languages, now divided on such terms as " elevator " and " lift ", " braces " and " suspenders ", by adding this particular.

There may be another solution. C. of E., Paleyian theology directs us to the view that anything as widely distributed in Nature and active in so many ways must have major significance in the Order of the Universe. Since we cannot yet define this in any unitary way, perhaps an alternative to " serotonin "—viz., " confusotonin ", once proposed in jest—deserves more serious consideration by some appropriate reference committee.

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A. C. CORCORAN.

TREATMENT OF ADVANCED CARCINOMA OF THE BREAST

SIR,—In their valuable contribution of Jan. 16 Dr. Brinkley and Dr. Pillers make the dogmatic statement that " operation is necessary because X-ray castration does not completely stop ovarian function ". I am sure that many would be grateful to know the evidence for this statement.

In the breast clinic in this hospital the œstrogen content of vaginal smears has been seen to fall dramatically following radiation castration, and in other cases no appreciable alteration in œstrogen content has occurred following surgical castration. In these latter cases other sources of œstrogenic function are evidently still active and one would not conclude that the ovarian function had not been completely stopped by the operation. There is also abundant clinical evidence of regression of breast carcinoma following radiotherapeutic castration.

In many instances operation is undoubtedly to be preferred. When a rapid response is required in a patient with fulminating and rapidly progressing disease, the effect of surgical castration is more dramatic and more rapid than if ovarian function is affected by external radiation. On the other hand, it is our experience that the menopausal symptoms are less severe if X-ray castration is employed. It would, therefore, be unfortunate if the impression were gained that oophorectomy is always to be preferred to radiation castration.

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R. J. DICKSON.

IMMUNE TOLERANCE IN MOTHER AND FŒTUS

SIR,—It is difficult to understand why the fœtus, which achieves antigenic competence in utero, is not rejected by the mother by immune phenomena much in the manner that a primary skin homograft would be. Many explanations have been proposed for this surprising manifestation of immune tolerance but none has yet received general acceptance. Dr. Gordon's [1] intriguing hypothesis (Jan. 9), with which I cannot agree, prompts me to put forward my own theory which at the present time is based on ample contributory evidence and is strongly supported by preliminary experimental observations.

Although Woodruff [2] has postulated that the placenta may protect the fœtus by acting as a millipore filter, no account has been taken of the antigenic action of the placenta itself, which is, after all, of fœtal genetic origin. The syncytiotrophoblast may well play an important role in this respect, for this unique tissue is not only the first part of the embryo to come into contact with maternal tissue at implantation but also remains the sole fœtal tissue that ever associates with maternal

1. Gordon, I. *Nature, Lond.* 1960, **185**, 118; *Lancet*, 1949, i, 807.
2. Woodruff, M. F. A. *Proc. roy. Soc.* B, 1958, **148**, 68.

cells. The syncytiotrophoblast possesses many interesting features apart from its syncytial character. The nuclei are in general smaller than those of the adjacent cytotrophoblast and, although rapidly multiplying especially during the early stages of development of the placenta, are never seen in mitosis. Syncytiotrophoblast invades the endometrium with apparent impunity, eliciting no tissue reaction whatsoever. Recently, careful search by Sohval and his colleagues [3] has failed to demonstrate the presence of the Barr nuclear chromatin body in the nuclei of these cells in the placentas of female fœtuses, although it has been identified in every other cell type of such placentas.

These considerations lead me to suggest that the nuclei of the syncytiotrophoblast are haploid, possibly possessing only the maternal chromosome complement and thus resulting in a tissue genetically acceptable to both mother and fœtus.

Owing to the absence of mitoses it is impossible to test this hypothesis directly by chromosome counts, but the recently developed technique of Feulgen microspectrophotometry for the determination of the D.N.A. content of individual nuclei provides a useful method for attacking this problem. Comparative studies of D.N.A. content by this method, chemical estimations, and direct chromosome counts provide excellent agreement and it is established that this is a reliable method to determine the ploidy of any given nucleus.[4]

Preliminary results from study of material at present available indicate that the syncytiotrophoblast of immature placentas contains a large number of haploid nuclei. Tissue from therapeutic abortions, mature placentas, hydatidiform moles, and choriocarcinomas is now being collected for examination of nuclear D.N.A. content by microspectrophotometry.

A full discussion of the implications of this finding and the possible mechanisms involved is presented elsewhere.[5]

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Harvard Medical School. MICHAEL GALTON.

PAINLESS SKIN BIOPSY

SIR,—Chromosomal studies in man are usually conducted on cultures derived from marrow, blood, or skin. Skin has the advantage that it travels well, leads to good preparations without squashing, and is known to be capable of being maintained in culture for many months, but it is often regarded as difficult to acquire.

I have found, after taking many skin biopsies from myself, a very simple and painless method which requires little equipment, no local anæsthesia, no aftercare, leaves no scar, and yet provides adequate tissue for establishing culture. The term painless may seem exaggerated, but, with practice, this can be achieved. Even if inexpertly but carefully performed it is likely to be less painful than venepucture, while failure is impossible.

A piece of skin is made lax by gently squeezing between the finger and thumb, and a ridge of this skin is trapped between the shafts of a pair of forceps. The shafts should be rounded in cross-section. Toothed iris forceps are suitable if care is taken to keep the teeth clear of the skin.

The hump which bulges through the gap should be about 1 mm. high, 1 mm. wide, and 5 mm. long, and should not extend as far as the points of the forceps. After thirty seconds of gentle pressure the skin becomes pale and opalescent and is found to be completely insensitive. The protruding skin is removed by sliding a dry scapel or razor blade along the forceps away from the points. For cell culture, skin cleaning should be by some completely volatile fluid, as ether. Razor blades are convenient as they may be sterilised in an oven while still wrapped. The few drops of blood are adequate for 2–10 slides. The resulting wound is flame-shaped, and heals over without contraction; being very shallow, infection is unlikely.

The area chosen seems immaterial. The iliac crest region is convenient in children and babies, and skin may be taken during sleep.

Sections of the biopsy show approximately equal numbers of mesodermal and epithelial cells. The specimen is adequate for sexing, although only rarely will this be preferable to the buccal mucosa or the white blood-cells. Although small, the biopsy may also be of use in those skin disorders in which relatively rough treatment will not confuse the histology.

Medical Research Council
Population Genetics Research Unit,
Headington, Oxford. J. H. EDWARDS.

CLOSED WOUND DRAINAGE

SIR,—Primary closure of surgical wounds is the ideal, and although it is sometimes impossible, there is no longer a place for open drainage of wounds or drainage into dressings. Primary closure may be prevented by:

The need to drain a duct or a secreting hollow viscus.
Where a secreting gland has been transected.
The desirability of obliterating a tissue space by the removal of air, blood, or accumulated tissue fluid.
The drainage of a productive abscess.
The drainage of a site of infection where localisation has not occurred or where a fistula may form.

Closed drainage with or without suction has many advantages: infection is reduced, wound healing is expedited, the discomfort of soaked dressings is avoided, early changing of dressings is unnecessary, and the cost of treatment is less.[1]

The methods used in the surgical department of this general hospital in recent years are:

Water-seal drainage with or without suction.
Closed drainage for bladder cases.
A Penrose drain or pack.
Tube drainage with a plastic suction bottle.

Thoracotomy demands water-seal drainage, sometimes with suction, and closed drainage in such a case is a well-established method. In our practice when any form of suction is applied to the chest, a " three-tube " bottle providing a safety valve is always fitted to the system between the source of suction and the standard water-seal bottle.

Closed drainage for bladder cases is also standard. Before the operation we use the Gibbon's plastic catheter and bottle.[2] After operation whatever catheter is employed, whether urethral or suprapublic, is connected to a Tudor Edwards empyema bottle. The neck of this bottle is sealed with a rubber cork, and the air vent is occupied by a thistle-shaped steel cup containing formalin tablets, loosely wrapped in gauze.[3]

In some cases tube drainage may be unsatisfactory—for example, in a case of appendicitis with perforation, especially if the appendix is retrocæcal or requiring much dissection. It may be unsatisfactory because, though it establishes drainage from one loculus, other pockets of infection may develop in the pelvis or elsewhere. Provided the appendix has been removed and the appendix base securely closed—that is, if the source of pus formation has been removed and the risk of fistula formation has been minimised—it is better, we feel, to use the Penrose drain. This prevents further bleeding and accumulation of fluid by exerting pressure on the raw area, and at the same time it promotes healing and forms a track if infection or fistula formation should ensue. This drain is left undisturbed for five to six days.

If there has been much bleeding, or fluid is likely to accumulate, a drainage tube and suction will not only remove the fluid but also air, and thus reduce the size of any potential cavity (e.g., after mastectomy, retropubic dissection, neck dissection, renal surgery, and the removal of large space-occupying tumours). If a secreting gland has been transected, as in partial thyroidectomy, there is a further indication for drainage.

3. Sohval, A. R., Gaines, J. A., Strauss, L. *Ann. N.Y. Acad. Sci.* 1959, **75**, 905.
4. Leuchtenberger, C. *in* General Cytochemical Methods (edited by J. F. Danielli). New York, 1958.
5. Galton, M. *Nature, Lond.* (in the press).

1. Sheppard, M. D. *Lancet*, 1952, *i*, 1174.
2. Cosbie Ross, J., Gibbon, N. O. K., Damanski, M. *ibid.* 1957, ii, 520.
3. Riches, E. W. *Practitioner*, 1952, **169**, 388.

Evacuation of an abscess leaves behind a pyogenic cavity which continues to produce infected material. Closed drainage prevents the dissemination of infection, at the same time keeping the cavity empty and reducing its size.

In this group of cases we use closed drainage with suction, employing polyethylene bottles. No originality is claimed for the method but it has proved so successful that we feel its advantages should be more widely known. For the drainage tube we use a plain rubber or portex catheter of approximately size 10 (English gauge). To this is attached a light polyethylene bottle which has a screw-on cap with a tapering nozzle, also made of polyethylene. The walls of the bottle are lightly compressed as the nozzle is inserted into the end of the catheter, so that a low negative pressure is created, sufficient to draw pus, blood, or serum from the far end of the catheter into the bottle.

The advantages of this method are numerous:

Dressings remain clean and need not be changed in the early post-operative days when the wound is most tender. Economy in dressing materials and nursing time is considerable and bacterial dissemination is reduced.

It is a simple matter to check at any time that the system is functioning efficiently.

One has a sterile and immediately visual method of assessing when the drain might have fully served its purpose and be withdrawn without any need to disturb the dressing.

The quantity of drainage is measurable, and can be recorded on the patient's fluid chart when appreciable in amount.

The bottles are made of low density polyethylene and are very light to handle.

They are cheap and can be used many times.

This suction drain operates continuously and silently with very little supervision.

The patient can be fully ambulant while suction is maintained.

Attention to the following practical points is important. The drain tubing must be firm enough so that it will not collapse with the negative pressure. For this reason we use a Jacques or Harris catheter with several extra holes cut. The fluted proximal end allows easier insertion of the nozzle and can be

cut to the size required for a secure fit. The catheter is held by a double suture inserted close on each side (see figure) and it is important to avoid puncturing the catheter with the needle.

It is essential to avoid over-compression of the bottle especially after repeated use, otherwise it will become kinked and will not re-expand. The bottle interior is sterilised by filling with a 1 in 20 solution of carbolic and there has been no sepsis attributable to the use of this method. Two sizes of bottle (4 oz. and 10 oz.) have been used, the smaller size being suitable for most cases. Experiment has shown that both sizes of bottle can draw up a column of water 4 mm. in diameter to a height of 100 cm. After repeated use the polyethylene tends to harden and the suction power is reduced. This negative pressure has not given rise to any complications in practice and compares favourably with the use of many electric pumps which may go on building up an ever-increasing negative pressure. Moreover, they effectively immobilise the patient and may cause considerable annoyance if the pump is noisy. The polyethylene bottles, on the other hand, are eminently portable and silent.

Despite the limited calibre of the catheter and dispenser spout, there has been no tendency to blockage. We are at present experimenting with nozzle fittings of different shape and size. The screw-on top is being retained, however, because of the access it allows for cleaning.

I am grateful to Mr. J. Hutchison for much helpful criticism and advice, and to Mr. P. S. Waldie, A.R.P.S. for the diagram.

Stobhill General Hospital, Glasgow. F. T. CROSSLING.

BONE-MARROW GRAFTS IN LEUKÆMIA

SIR,—In the discussion of the use of autologous marrow grafts in your leading article of Jan. 23 mention is made of three of our cases of leukæmia in which we employed total-body irradiation and infusion with autologous marrow obtained during a remission.[1] It might be of interest to add the follow-up of the patient in whom a remission was achieved by this procedure.

The patient, a 2-year-old girl, remained well until the 84th day after irradiation, when the liver, spleen, and lymph-nodes were observed to be enlarged, and a bone-marrow aspirate showed recurrence of leukæmia. A-methopterin therapy, to which she had become refractory before irradiation, was reinstituted, with some regression in the size of the lymph-nodes and a fall in the white-cell count. However, she died while being given a blood-transfusion 102 days after irradiation. Postmortem examination showed leukæmic involvement of the liver, spleen, lymph-nodes, bone-marrow, and kidneys. Several walled-off splenic abscesses caused by *Staphylococcus aureus* were present. In addition to involvement by leukæmic infiltrates the lymph-nodes showed scattered follicles, and the stomach and intestines contained many prominent lymphoid follicles with germinal centres.

Although a remission was obtained in this one case, we believe that further investigation is necessary to determine whether bone-marrow grafts are of practical value in the treatment of leukæmia.

LEONARD ATKINS
JOSEPH J. MCGOVERN
PAUL S. RUSSELL
EDWARD W. WEBSTER.

Massachusetts General Hospital, Boston.

DISCHARGE FROM A HOSPITAL VACUUM SUCTION SYSTEM

SIR,—A piped vacuum system is being installed in New Guy's House, which is now under construction. This department was asked to advise whether there was any danger from the exhaust from such a system, which might collect pathogenic organisms, particularly antibiotic-resistant staphylococci, and discharge them into the atmosphere. As inquiry revealed no information on this matter, it was decided to investigate an existing vacuum system. That at the Royal Marsden Hospital was selected.

It was installed in 1948 and consists of suction points, in three operating-theatres, a reservoir tank, and a pump in the basement with a discharge pipe to a basement yard. The vacuum is maintained between 15 and 25 in. of mercury. Through the cooperation of the Royal Marsden Hospital and British Oxygen Gases Ltd., the following investigations were carried out:

(1) Three sections of pipe were cut out—near a suction point, in the main vacuum line from the theatre floor, and just before the tank. The inside of each pipe was found to be dry and macroscopically clean. Swabs were taken from these three sites and from the inside of the tank. Direct plating produced no growth, and enrichment in broth grew *Staphylococcus albus* and diphtheroids from two swabs only.

(2) The effluent air was sampled by passing it through a plug of sterile alginate wool of approximately 1 cm. diameter which was then dissolved in a 1% sodium hexametaphosphate solution containing 10% horse serum. The resulting solution was cultured. Two tests were made on different days in which 150 and 200 litres of air (as measured by a gas meter) respectively were pumped. On the first occasion the vacuum was broken at the entrance to the tank; no organisms were recovered. On the second occasion the vacuum was broken at a suction point in a theatre so that air was drawn through most of the system. *Staph. albus* was isolated, on enrichment only.

Quantitative control tests using *Staph. aureus* showed that the solvent used was not significantly inhibitory.

1. *New Engl. J. Med.* 1959, **260**, 675.

(3) The tank was opened by British Oxygen Gases Ltd., and was found to be surprisingly clean. No fluid was present, but there was evidence that there had been a pool of liquid at some time, as there was a " high water mark " of encrusted deposit. When this was examined under the microscope no microorganisms could be seen and it yielded only a micrococcus and an aerobic sporebearing organism, separately from two enrichment cultures.

Thus it was not possible to isolate any pathogenic organisms from the system examined, and non-pathogens could be recovered only by enrichment methods. The difficulties of using an aseptic technique in the circumstances described do not rule out the possibility of chance contamination. The low level of contamination was a little surprising, but it may be due to the dry conditions inside the vaccum system, the lack of nutrients, and possibly the fact that much of the piping was of copper. " Heat-sterilisation " of air has been achieved by adiabatic compression in reciprocating compressors,[1] and the pump in the system here described may have been acting in this way.

The significance of one set of tests on a single vacuum system is doubtful, and different results might be obtained in a hospital where many septic cases were treated, but it is thought that the information obtained is of sufficient interest to be worth reporting.

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London, S.E.1. J. C. KELSEY.

DEPRESSION AND IMIPRAMINE

SIR,—Undue sweating has been described as a side-effect of imipramine (' Tofranil '). It appears to me, after a certain amount of experience with this drug and its effects on endogenous depression, that those patients who respond well tend to complain of undue sweating in the early stage of their treatment, whereas those who do not respond do not notice any such sweating.

Can it be that we have here a sign of prognostic import which might be useful in determining whether it is worth persevering with this drug in certain cases?

I should be extremely interested to hear from your readers who have perhaps greater experience with imipramine whether they have noticed any such correlation between excessive sweating and good prognosis.

London, W.1. R. CEDRIC SIMPSON.

CHROMOSOME COMPLEMENT IN A MONGOLOID MOTHER, HER CHILD, AND THE CHILD'S FATHER

SIR,—Of the three human diseases due to a chromosome abnormality—mongolism, Klinefelter's syndrome, and Turner's syndrome—mongolism is the only one in which instances of fertility have so far been reported. To our knowledge there are six reports of women with mongolism having had a child which was adequately described.[2–7] Three of the children were mongols.[3 6 7] It is of obvious interest to obtain information on the karyotype of these fertile mongoloid patients and their offspring. Levan and Hsu [8] have briefly mentioned the result of such a study in a mongoloid mother whose son had a normal chromosome complement.

We have investigated a mongoloid mother, her son, and the reputed father by determining the chromosome complement of cells cultivated in vitro. A detailed description of these individuals was given by Forssman and Thysell.[4] Bone-marrow cells were cultivated according to a technique described by Fraccaro et al.[9] The 35-year-old mother had 47 chromosomes. The apparently normal 5-year-old boy and the father, a 59-year-old blind man with epilepsy, had normal karyotypes of 46 chromosomes.

Further details will be published elsewhere.

Pediatric and Psychiatric Departments and Institute of Histology, University of Gothenburg, Sweden. O. LEHMANN H. FORSSMAN.

AUTOGENOUS VACCINES AND THE COMMON COLD

SIR,—I must apologise for writing you a long letter on this subject, but the trial reported in your issue of Feb. 13 requires some strong comments. This R.A.F. trial, although using the same vaccine, was conducted on essentially different lines from that reported by me in 1958. The points of difference are:

(1) Last paragraph of preamble (p. 358): " The vaccines were prepared in the same way as Ritchie had prepared his, but the dosage schedule was modified, as weekly injections would not be welcomed by healthy men and would be difficult to arrange on an operational flying station." The variation in the dosage schedule invalidated the whole R.A.F. trial from the beginning. Our trial, which, it must be noted, really lasted for over 25 years, depended on the maintenance of immunity over a period, by regular weekly injections, not by a mere token series of three in October plus one single injection in January. As I pointed out at the time, that system of dosage is completely subminimal and useless, rendering their results quite valueless. They can in no way be compared with the results I reported in 1958.

(2) The next sentence in the same paragraph on p. 358 reads: " Furthermore there seemed to be no theoretical reason why weekly injections should produce a better immunological response than a more usual course." There is no " usual course " in a prophylactic cold vaccine of this kind. No-one has tried the procedure but myself, and I have found from experience that the only course is one of weekly injections throughout the part of the year concerned. If the R.A.F. found this impracticable they should not have tried a makeshift substitute of their own, much less have attempted to compare it as if it were on the same lines as previous work. The phrase " usual course " suggests a complete confusion of mind between coccal vaccines and those prepared for the zymotic diseases, such as typhoid, where one attack confers lifelong immunity, more or less. Anyone who has used *Staphylococcus aureus* vaccines, for example, over a period of years with 100% success, as I have, knows that these coccal vaccines must be maintained over a considerable period to get the result. That is the " usual course " for a coccal vaccine, not a few haphazard doses at intervals.

Table III (p. 360) has an interesting comment, that volunteers who were vaccinated did not lose less flying-time " except to a small degree during the first 2 weeks after inoculation with autogenous vaccine ". In other words, during that period the vaccine was beginning to work, but with the cessation of regular injections the effect was lost. Had these been carried on the results might well have been greatly different. The comment on table IV shows a similar trend.

" There was, however, an interesting reduction in the incidence of illness in the autogenous-vaccine group in the period when it might be expected, between the 3rd and 6th weeks after inoculation." This fits in with my comment in the previous paragraph and again suggests that the vaccine was beginning to work.

It is also observed that " a vaccine designed to prevent secondary bacterial infection would be expected to reduce the severity of illnesses rather than their incidence ". That is frankly nonsense. Vaccines of this kind are intended to promote resistance and therefore to reduce incidence. Once resistance is overcome, the severity of an illness depends

1. Sykes, G., Carter, D. V. *J. appl. Bact.* 1954, **17**, 286.
2. Sawyer, J. M. *Amer. J. ment. def.* 1949, **54**, 204.
3. Lelong, M., et al. *Arch. franç. Pédiat.* 1949, **6**, 231.
4. Forssman, H., Thysell, T. *Amer. J. ment. Defic.* 1957, **62**, 500.
5. Schlaug, R. *Acta genet.* 1957, **7**, 533.
6. Rehn, A. T., Thomas, E. *Amer. J. ment. Defic.* 1957, **62**, 496.
7. Stiles, K. A. Proceedings of X International Congress of Genetics, Montreal, 1958, vol. 2, p. 276.
8. Levan, A., Hsu, T. C. *Hereditas*, 1959, **45**, 665.
9. Fraccaro, M., Kaijser, K., Lindsten, J. *Ann. hum. Genet.* (in the press).

chiefly on the virulence of the infecting agent, and an infection powerful enough to overcome an enhanced resistance will necessarily be severe. Even typhoid, if I may quote a zymotic vaccine as a parallel in this case, is not necessarily milder in the vaccinated when it occurs.

In short, this R.A.F. test proves nothing except that a thing is not worth doing unless it is well done. The only sentence with which one can wholeheartedly agree is the last in the paragraph under Comments, that " autogenous bacterial vaccines, perhaps in greater dosage, may therefore merit further investigation among less healthy persons ". Even here the word " perhaps " should be replaced by " certainly ".

Birkenhead. J. MORRISON RITCHIE.

PERTHES' DISEASE

SIR,—You annotation of Feb. 16 refers to my finding [1] that in cases of Perthes' disease with partial involvement of the upper femoral epiphysis the prognosis was better than in those cases in which the whole epiphysis was involved. A study of my figures will show that this is so, when variations in age and sex have been eliminated. The prognosis appears to become much worse if the child is eight years old or over at the time of diagnosis.

In regard to the long-term end results neither the figures of Ratliff [2] or of Professor Trueta [3] absolve the orthopædic surgeon from adopting full treatment immediately.

Often in the young child the disease damages the whole epiphysis or a large anterior segment of the head. Traction in recumbency until reconstruction begins, followed by the wearing of a patten-ended calliper, gives good results in these hips. Mild cases do not require recumbency. In older children treatment does not seem to affect the result.

The Royal Hospital, Wolverhampton. J. A. O'GARRA.

NORADRENALINE EXCRETION IN INDIAN SUBJECTS

SIR,—Floyer [4] described a simple biological test for an approximate estimation of urinary noradrenaline. Urine was injected intravenously into an anæsthetised rat and the rise in blood-pressure was measured. This simple technique has been used to estimate the noradrenaline content in the 24-hour urine samples in eighteen Indian subjects (fourteen hypertensives and four controls).

A slight modification in the anæsthesia was that 0·6 ml. per 100 g. body-weight of 25% urethane was injected intraperitoneally, and no further subcutaneous injections of urethane were given to prolong the anæsthesia for several hours.

The results indicated that the excretion of noradrenaline in Indian subjects is about the same as that described elsewhere.[5] In thirteen of the subjects the noradrenaline content was 65 μg. or less in 24 hours. Robson and Keele [6] stated that the normal concentration of catecholamines in urine is 5–15 μg. per 100 ml. urine. In our results seven subjects had a noradrenaline excretion equivalent to 1·5 μg. per 100 ml. or less, while four excreted less than 4 μg. per 100 ml. urine. It is possible that values less than 5 μg. noradrenaline per 100 ml. urine are normal for Indian subjects.

The method described by Floyer [4] is a simple and convenient way of estimating the noradrenaline content of the urine and screening cases for phæochromocytoma. The noradrenaline content in 24-hour urine in Indian subjects appears to be nearly of the same order as in other subjects described previously.

I should like to thank G. S. Ahluwalia for his excellent technical assistance.

Department of Pharmacology, All India Institute of Medical Sciences, New Delhi. RANJIT ROY CHAUDHURY.

1. O'Garra, J. A. *J. Bone Jt Surg.* 1959, **41B**, 465.
2. Ratliff, A. H. C. *ibid.* 1956, **38B**, 498.
3. Trueta, J. *Lancet*, 1960, i, 383.
4. Floyer, M. A. *Lancet*, 1958, ii, 1154.
5. Von Euler, U. S. Noradrenaline. American Lecture Series, no. 261. Springfield, Ill., 1955.
6. Robson, J. M., Keele, C. A. Recent Advances in Pharmacology. London, 1956.

PREVENTION AND TREATMENT OF BEDSORES BY SILICONE CREAM

SIR,—I should like to add a note to the report of Dr. Roberts (Jan. 30).

During the past two years, I have treated 80 patients in this hospital—the majority of whom were incontinent—with the creams I and II made and kindly supplied by Messrs. Ward Blenkinsop. Cream I containing dienœstrol is the more effective and is excellent for the prevention of sores when the skin becomes reddened at pressure points, for superficial bedsores, and for accelerating healing when deeper sores are beginning to fill in.

I did not, however, find it adequate as the sole dressing in treating deep bedsores, for which I still follow my previously published routine of changing the application used every three days until healing is initiated.

Royal Hospital and Home for Incurables, Putney, London, S.W.15. V. KENDALL.

RECESSION OF EXOPHTHALMOS AFTER MASSIVE DOSES OF RESERPINE

SIR,—Sir Russell Brain [1] emphasised that, in sera from exophthalmic cases, a hypophyseal substance similar to T.S.H. is present. Dobyns and Wilson [2] produced exophthalmos in the minnow by injecting the serum of patients with severe or progressive exophthalmos, and their findings suggested some correlation between the degree of response in the fish and the stage and severity of the patients' exophthalmos. Barraquer and Canadell [3] made similar observations. We should like to describe a patient with exophthalmos who reacted favourably to reserpine.

A woman of 45 was admitted to hospital in 1959 because of paranoic psychosis accompanied by disorientation, amnesia, depression, and suicidal drive. She had undergone thyroidectomy in 1944 because of Graves' disease, and a partial adrenalectomy in 1951 for phæochromocytoma. Apart from the psychotic disturbances, severe diencephalic and endocrine insufficiency syndromes had developed in the patient. The most troublesome symptom was severe exophthalmos. For six months she had no menstrual cycle, apparently because of incipient menopause.

Reserpine (10 mg. daily) was injected intramuscularly. Definite improvement in the exophthalmos was noticed after five days, whereupon the reserpine was discontinued. Within a week, the exophthalmos recurred as badly as before. Reserpine was renewed, and by the eighteenth day the exophthalmos was hardly noticeable.

Urinary F.S.H. was continuously assayed during this period, decreasing from 50 rat units per litre before treatment to less than 25 later. This improvement in the exophthalmos and the endocrine symptoms did not, however, produce any obvious change in the psychosis, and disorientation, amnesia, and depression persisted.

We have been able to show that reserpine depresses some pituitary tropins, especially F.S.H., apparently via the hypothalamus, and we therefore assume that in the patient whose urinary F.S.H. levels were high, reserpine depressed the pituitary secretion of both the exophthalmo-

1. Brain, W. R. *Lancet*, 1959, i, 109.
2. Dobyns, B. M., Wilson, L. A. *J. clin. Endocrin.* 1954, **14**, 1393.
3. Barraquer, J., Canadell, J. M. *Rev. esp. Oto-neuro-oftal.* 1955, **14**, 274.

genic factor and the gonadotrophic factor. The question is still open whether this case is a singular one and reacted to reserpine because it was a hypophyseal-diencephalic exophthalmos, as described by Zondek,[4] or whether every exophthalmos is liable to recede after high doses of reserpine.

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F. G. SULMAN.

TREATMENT OF CEREBRAL FAT-EMBOLISM

SIR,—Reading the article [5] by Dr. Harnett and his colleagues, I was surprised at the remark, "Attempts at specific treatment have not been very successful." I do not agree and I wish to draw attention to two articles published during recent years.

(1) The first [6] was concerned with the excellent results of decholin therapy, as described by Rappert,[7] obtained in the O. L. Vrouwe Gasthuis, Amsterdam.

(2) The second paper [8] was also concerned with the decholin therapy of fat-embolism. Results showed that only 8 out of 100 patients with severe fat-embolism died. A very successful treatment indeed.

Amsterdam. A. G. J. VAN SONDEREN.

Public Health

Influenza

ACUTE respiratory infections have been increasing in past weeks in the Northern Hemisphere. As in every year since 1957–58, the World Health Organisation reports, the outbreaks seem to be mainly due to the A2 (A/Asian) virus, although in some places, notably Finland, virus B seems to be responsible. The disease is nowhere as widespread as in 1957–58, and is generally benign and of short duration, although as in every influenza epidemic there are some deaths from pneumonia, usually in elderly people or those suffering from other diseases. The situation as reported to W.H.O. is as follows:

United States.—In the week ending Jan. 23 there were localised outbreaks of influenza, but absence from schools and in industries most affected by the disease did not exceed 15–20%. Influenza due to virus A2 was confirmed in 12 States and the District of Columbia, and there were reports of epidemics of acute respiratory infections of which only a few were confirmed to be influenza in 11 others.

France.—The epidemic is more important in the country than in Paris, the principal centres of infection being the east, centre, south-west, and south-east. Virus strains have not yet been identified.

Netherlands.—Virus A2 was isolated from a fatal case of virus pneumonia in The Hague.

Sweden.—Localised outbreaks of a mild influenza-like disease, which has not yet been identified, have been reported from several garrisons in the north and south of the country, but so far there has been no spread to the civil population.

Switzerland.—The number of influenza cases reported grew from 385 in the week ending Jan. 16 to 2837 in the week ending Jan. 23. The cantons of Zurich, Basle-Town, Geneva, and Grisons were the worst affected.

In this country the Ministry of Health's weekly influenza statement for the week ended Feb. 13 said there had been no laboratory evidence of influenza virus A or B, nor other evidence of the prevalence of influenza.

4. Zondek, H. Die Krankheiten der endokrinen Druesen; p. 305. Basle, 1953.
5. Harnett, R. W. F., Paterson, J. R. S., Lowe, K. G., Stewart, I. M., Vytman, J. D. *Lancet*, 1959, ii, 762.
6. Sonderen, A. G. J. van. *Ned. T. Geneesk.* 1957, 101, **538.**
7. Rappert, E. *Dtsch. Z. Chir.* 1938, **250,** 276; *Wien. klin. Wschr.* 1953, **65,** 603.
8. Schmitter, H. *Münch. med. Wschr.* 1958, **43,** 1658.

Medicine and the Law

A Partner's Notes

AT the hearing of a wife's petition for divorce on the ground of cruelty, a doctor who had seen the wife from time to time over the past few years was called to give evidence relating to her health. This doctor, who was in partnership with another doctor, used, for the purpose of refreshing his memory while giving evidence, the wife's medical history card. This card recorded dates upon which the wife was seen, complaints made by her of her husband's behaviour to her, of her own health, and the treatment prescribed. The card contained notes made not only by the doctor giving evidence, but also by his partner relating to an occasion when the partner saw the wife. The question arose whether the witness could give in evidence notes recorded by his partner, the latter not being called as a witness.

Mr. Justice PHILLIMORE ruled that by the Evidence Act 1938 notes made by the partner could be given in evidence, in so far as the notes recorded facts, such as the date on which the wife was seen and the treatment prescribed, but that the notes concerning the complaints made by her were not admissible.

Robinson *v.* Robinson—*Probate, Divorce, & Admiralty Division:* Phillimore, *J.* Feb. 18, 1960. Counsel and solicitors: John Alliott (Rootes & Alliott, of Folkestone).

D. R. ELLISON
Barrister-at-Law.

Parliament

Social Workers and Their Training

ON Feb. 17 the EARL OF FEVERSHAM drew attention to the Younghusband report [1] and sought the Government's reactions to its recommendations. His own were favourable, for he believed that lack of training and status had lost the social services many potential recruits in the last fourteen years. The local authorities' growing responsibilities under the welfare and health Acts made the recruitment of more social workers a matter of urgency. He was particularly impressed by the need for trained mental-welfare officers; 40% of the present officers were due to retire within the next ten years.

Lord AMULREE felt that the training proposed in the report was a trifle on the theoretical side. He was also uneasy about the report's tendency to regard the health and welfare departments as separate entities. In his view there was some sort of medical aspect to most welfare and social work and he would like to see the welfare and health departments, if not combined, which would be ideal, at least working closely together, with the medical officer of health a member of the two committees or having both working under his care.

Baroness WOOTTON OF ABINGER thought that some of the report's recommendations were not entirely realistic. The grading of the workers and the classification of the cases seemed to her too tidy. In practice people might be handed from one worker to another. One of the besetting diseases of our community was a delight in professionalism for its own sake. Another was a tendency to confuse the economic and psychological. She would be the last to dispute that where there was a problem of mental health, psychological training was essential, and it was deplorable that so few of our mental-welfare workers had had that kind of training. But she thought that interest in psychological problems sometimes led to failure to discriminate between a plain practical need—often lack of money—and a true mental or psychological difficulty. In her view many of the problems with which the social worker had to deal were basically economic. People who had fallen into difficulties from lack of money should not be treated as though they were failures in personal or social functions, and she hoped that the Government would be cautious in the

1. *Lancet*, 1959, i, 974

type of training which they provided for the modern social worker. Might the report be made the occasion for fresh thinking about a new orientation for the role of the social worker in our society?

Baroness SWANBOROUGH was worried about the suggestion in the report that people who were at present doing good work should have to submit to further training. She welcomed the idea of a form of training but thought that the over-elaboration which came with an obsession for professionalism was a hazard. She agreed that there was infinite danger in assuming that because people were in financial need they must be handled by trained social workers. Social welfare was a continuing process, and trained workers should have volunteers to continue the work at the local level. Voluntary service should be the mortar between the bricks of officialdom.

Lord TAYLOR agreed that it would be better not to categorise too much in planning the future training of social workers, and he thought that perhaps the idea of the welfare assistant could go. But everyone was agreed on the need for many more social workers. The question remained: would the Government pay the extra salaries which these people would have to get?

The main message of the report, Lord ST. OSWALD had found, was that social-work services needed more training and more manpower. To him the two went hand in hand, for one of the incentives to recruitment would be training. To this end the Younghusband Committee had made purposeful and detailed proposals. The Government were grateful to the authors of the report and were now weighing, not only their advice, but the advice they had drawn from other quarters. The recommendations must be considered in the light of local-authority views. Equally, several departments, including the Ministry of Health, that of the Secretary of State for Scotland, the Home Office, the Ministry of Education and, last but not least, the Treasury were closely concerned. The local-authority associations and the main voluntary bodies had already expressed their general views. It might be necessary now to obtain their views on specific details, but time would not be wasted.

Welfare of Office Workers

THE Offices Bill was introduced as a private member's measure by Mr. Richard Marsh on Dec. 11. Although the Government felt that it should not proceed, the second reading was carried.[1] The Government have now signified their support by tabling a money resolution authorising an increase in the payments to local authorities to meet the cost of enforcing the measure.

QUESTION TIME

Locum Tenens

Mr. L. A. PAVITT asked the Minister of Health if he was aware of the inadequacy of the present arrangements to employ locum tenentes in general practice and the hospital services.—Mr. WALKER-SMITH replied: I am aware that individual difficulties sometimes occur, but I am not clear that action by me would be appropriate. Mr. PAVITT: In view of the fact that so many of these difficulties occur because of the time taken to solve these problems of locum tenentes, will the Minister give consideration to the introduction of a scheme for a local service, and further, will he consider the possibility of using the trainee assistants scheme in order to help in this respect? For example, if the trainee were given two months at the end of his normal training period to enable him to obtain wider experience on a general basis and also in hospitals that would help. Will he also consider the possibility of refresher courses for consultants and specialists, so that they may come down into the arena of family doctoring, which might be beneficial to them and help the general practitioner in solving his problem of locums?—Mr. WALKER-SMITH: On the first of those three points, I doubt whether an organised service of the sort suggested would really meet the case because there are so many and varied personal factors involved in these matters. On the second point, I should like to consider the suggestion. The third point is very revolutionary in a professional service, and I think that, like Agag of old, I had better tread delicately.

Dr. EDITH SUMMERSKILL: While not asking the Minister to commit himself now, will he reconsider his first answer? As he realises, the great majority of doctors today are employed by the State and find it very difficult to obtain a deputy in case of illness; in fact, there is no certainty that they can obtain a deputy. This also applies during holidays. We should at least equate doctors with Civil Servants so that deputies who can be relied upon are available. Perhaps the Minister will reconsider the whole matter?—Mr. WALKER-SMITH: I am always ready to consider further these matters, but I was giving my impression as it now stands. We should not exaggerate the difficulties about locums. In particular, we have to remember that there has been a considerable increase in the number both of general practitioners and hospital doctors overall. These difficulties have to be seen against that more satisfactory background.

1. See *Lancet*, 1959, ii, 1151.

Obituary

FRANK BARNES

M.S. Lond., LL.D. Birm., F.R.C.S.

Mr. Frank Barnes, consulting surgeon to the Birmingham General Hospital, had made many gifts to the United Birmingham Hospitals and the Medical School, and a ward in the Queen Elizabeth Hospital is dedicated to him. The postgraduate surgical travelling fellowship he endowed in 1944 has enabled young surgeons to widen their experience by working abroad. More recently he gave generously towards the building of the new library at the Medical School which, in recognition of his own and the late Stanley Barnes' distinction and generosity, has been named the Barnes Library. Mr. Barnes was to have performed the opening ceremony last October but to everyone's sorrow he was too ill to do so. He died on Feb. 18 at the age of 90.

He was born, lived, and worked in Birmingham all his life. After qualifying from Mason College, Birmingham, in 1898, he took the degree of M.B. Lond. two years later. He held many resident surgical appointments before being elected to the honorary staff of the Birmingham General Hospital in 1903. He was also consulting surgeon to the Birmingham and Midland Eye Hospital, the Hospital of St. Cross, Rugby, and the Sutton Coldfield Cottage Hospital, and for ten years he was on the staff of the Birmingham Orthopædic and Spinal Hospital (now the Royal Orthopædic Hospital). During the 1914–18 war he served in the R.A.M.C.

As a teacher he was lucid and orthodox and in the University was lecturer in anatomy and operative surgery. He published little and he evaded high office and public recognition, but he served as president of the Midland Medical Society in 1930. In 1957 the University of Birmingham conferred on him the honorary degree of LL.D.

A. G. W. writes:

"Mr. Barnes was a surgeon of outstanding ability, combining high diagnostic acumen with superb operative skill and dexterity and these qualities and his quiet, friendly, and unassuming personality made him one of the most sought after surgeons in the Midlands over many years. He practised in the days before the increasing diversity and complexity of surgical techniques demanded narrow specialisation and he was essentially a general surgeon, but his major interests were abdominal surgery and neurosurgery. He was one of the first surgeons in England to operate successfully on tumours of the spinal cord.

"Although they were not related, Mr. Barnes and the late Stanley Barnes were close friends and they spent much of their leisure together fishing, playing golf at Moseley Golf Club, and bridge at the Clef Club. Mr. Barnes was also a keen

gardener and a connoisseur of wines. His death ends a long and happy life of great achievement and distinction, during which his kindness, generosity, and warm nature won him many friends."

OLIVER FRANCIS HAYNES ATKEY

C.M.G., M.B. Lond., F.R.C.S.

Dr. Atkey, a former director of the Sudan Medical Service, died in London on Feb. 11.

He was a student at King's College Hospital before it moved to Denmark Hill, taking his M.B. Lond. in 1904 and his F.R.C.S. the following year. After holding house-appointments at King's College Hospital and the Royal Free Hospital he joined the Sudan Medical Service in 1907. Like all new recruits at that time he spent several years doing reliefs and special assignments in the six northern provinces. After the 1914–18 war he was appointed to Wad Medani in medical charge of the Blue Nile province, south of Khartoum, which was then being developed as the great cotton-growing area of the country. In 1922 he was appointed director of the service, and he held this administrative post till 1933.

H. C. S. writes:

"During the first nine years of Atkey's directorship, the Sudan Medical Service shared in the general development of the country. Its work increased fourfold and more of the southern and eastern provinces came under effective medical control. Important training schemes were either inaugurated by Atkey or were greatly developed under his inspiration, and the Kitchener School of Medicine for Sudanese students was opened in 1924. It was almost entirely due to Atkey's efforts that money was raised not only to pay for the buildings but also to provide a sum of £E24,000 as a nucleus for an endowment fund. By 1931 the effects of the world slump reached the Sudan, and for a time progress in all Government departments ceased. Recovery however was rapid and by the time of Atkey's retirement in 1933 expansion had been resumed.

"He was a keen horseman and he played polo and tennis with his customary vigour. He did not practise after leaving the Sudan but travelled widely, often by air in his own plane with Mrs. Atkey as co-pilot. This special interest terminated in a crash in central Africa when en route for the Cape. During the late war he was employed in organising and inspecting first-aid posts in the London regional area. For the last four years he had been in poor health and his activities were seriously curtailed. In his own sphere he had played an important role in the Sudan's growing capacity for independence."

RUPERT GEORGE ANDERSON

M.D. Edin., D.P.M.

Dr. R. G. Anderson, one of the Lord Chancellor's visitors in lunacy, died on Feb. 12.

He was educated at Glasgow Academy, Loretto School, and Edinburgh University, where he graduated M.B. in 1924. He joined the London County Council mental service in 1925, and held posts at Long Grove Hospital, Cane Hill Hospital, and Horton Hospital, where he was deputy medical superintendent. In 1938 he was appointed a commissioner of the Board of Control and, apart from three years during the late war in the Middle East as a lieut.-colonel in the R.A.M.C., he remained with the Board until 1953, when he was made a Lord Chancellor's visitor.

W. D. N. writes:

"Anderson was a most delightful colleague, loyal and conscientious. He was truly loved by both patients and staff. He was a good clinician and in his duties as a Chancery visitor he exhibited great tact and shrewdness. His courtesy and manner were almost Victorian. In many ways he was a born actor and mimic, full of good humour. He will be greatly missed by his colleagues and many friends in the provinces."

Dr. Anderson is survived by his wife, a son, and two daughters.

GILBERT WINTER DRYLAND

M.B. Cantab.

Dr. G. W. Dryland, who died on Feb. 3, qualified at Guy's in 1907. Before the first world war he had settled in practice at Kington in Herefordshire where he spent the rest of his life.

R. E. I. writes:

"Dr. Dryland lived life to the full and delighted in it. He was a keen nature-lover and antiquarian. Kington, lying in the little known border country between England and Wales, with its rolling hills, its flower lanes, its clouds and sunshine, its meadows fenced with white iron railings, its streams running to the Wye Valley and its half-timbered houses, meant much to him, and he captured its beauty in photographs which adorned his home. His garden was as lovely as any I have known. He also enjoyed travelling and sailing. He was a pioneer motorist who owned a car when motoring was still an adventure. It always gave him pleasure to recall how his first car would only climb a certain hill if driven backwards.

"Perhaps his most endearing characteristic was a beautifully quiet sense of humour which kept peeping out in all he did. It informed a great deal of his writing and made it a joy to receive a letter from him. Several Guy's men, of whom I was one, enjoyed doing locums in Kington for him, for to do so was to see country practice at its very best. He was sustained by a deep religious faith and was as much beloved for his kindness and gentleness as for his great experience and professional skill."

VASSILI ALEKSEEVICH GILYAROVSKI

Dr. Gilyarovski, professor of psychiatry at the Second Moscow University, died last year at the age of 83.

Gilyarovski came from a poor family in Southern Russia and began to work for money early when he was still a schoolboy and student, coaching pupils and taking part in anti-epidemic campaigns, in mass-vaccination, and in other social activities among the population. He studied under Korsakov, Serbsky, Kozhevnikov, and especially under the physiologist Ssechenov for whom he had a great admiration. After serving his apprenticeship in mental hospitals and after some work in neuropathological laboratories, his main interest became the treatment of neurotics and of minor psychiatric abnormalities. He did psychiatric work with children and organised speech therapy, was at one time an advocate of the psychoanalytic ideas of Freud in Russia. As president of the Society of Psychiatrists and Neuropathologists he took an active part in the extension of the network of psychoneurological clinics in all towns of the Soviet Union, and he drew up rules for these institutions providing full-time care, and day-hospital care, and guardianship. He was always much concerned with the practical side of medical work. In the early '30s he seems to have conceived the idea of the day hospital as a new type of psychiatric institution.

W. M.-G. writes:

"From his preference for humanitarian and pathogenetically well-founded therapy methods came his opposition to the extensive use of electro-shock in psychiatry and to leucotomy. It may well be that the latter was prohibited in the U.S.S.R. on the instigation of Gilyarovski. He himself elaborated what he called a physiological method of treatment 'electrosleep' and wrote a monograph about it. This was an electrically induced sleep state, based on Pavlov's idea of the importance of protective inhibition in the cortex. Gilyarovski's scientific views were towards his later years very much influenced by Pavlov, who himself provided a comprehensive theory of psychic phenomena on the basis of his physiological concepts of reflex activity. Gilyarovski tried to extend and to confirm Pavlov's views, and it may well be that he was one of those responsible for the undisputed prevalence of Pavlovian ideas in modern Russian psychiatry."

Notes and News

PROGRESS IN IMMUNOLOGY

LONG a source of tools indispensable to bacteriology, blood-transfusion, and diagnosis, immunology has latterly become an enlarging area of biological research. Everywhere there is talk of its new facts and new theories, particularly those relating to immunological tolerance and autoimmunity. Perhaps because of their apparent relevance to problems of surgery and medicine, many workers are now concerned with the mechanisms of antibody responses, especially at the cellular level, and their relation to tissue reactions.

An impressive share in the recent advances belongs to the Walter and Eliza Hall Institute, Melbourne, and to its director, Sir Macfarlane Burnet. His annual report on the work of the institute [1] is a reminder of what is being done there on the fundamentals of immunology. Current investigations deal among much else with the production of antibody by single cells, the cellular transfer of antibody-producing capacity and of characteristic responses, and the genesis and regeneration of plasma cells. Work is also in progress on the behaviour of tolerant cells in many situations, on the metabolic activity of lymph-nodes, and on the production of autoimmune disease experimentally by cell transfer. Throughout, the emphasis is on the immunological reactions and relationship of cells and their subcellular components—an approach which keeps the institute well to the fore in biological research. The clinical research unit there provides a medical link with the experiments. Clinical studies in the immunology of, for example, systemic lupus erythematosus, lupoid hepatitis, thyroid disease, and macroglobulinæmia have produced interesting new facts—sometimes puzzling ones.

One of the chief problems of autoimmune disease, whether clinical or experimental, is the relative significance in the disease process of the various antigen-antibody systems which are being discovered. Little headway has yet been made in characterising specific antigens involved in tissue reactions. Progress at the Melbourne institute encourages workers elsewhere in the attempt to define the extent and importance of immunopathology in human disease.

MEDICAL REFERENCES

THE first issue has now appeared of the *Index Medicus*, which is to replace the *Current List of Medical Literature* of the National Library of Medicine of the United States Department of Health and the *Quarterly Cumulative Index Medicus* of the American Medical Association. The new index will be published monthly by the Library, and sold by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. ($20 per year, $25 foreign; single copies $2·25). The monthly issues will be collated each year, and an annual *Cumulated Index Medicus* will be sold by the Association.

Postgraduate Medical School of London

At a reception on Feb. 17 at Hammersmith Hospital, the guests were received by Lord Alexander of Tunis, president of the school, and Lord Coleraine, chairman of the school management committee. Lord Alexander spoke of the help the school was receiving from the Dominions, particularly in the matter of the appeal to finance the new buildings. The appeal had started very well in this country; Pakistan and South Africa had contributed generously; and, Lord Alexander added, Canada was able to play her part, now that income-tax difficulties had been overcome, thanks to the generosity of Canada and Lord Coleraine's personal help. Lord Coleraine said that when the extent of Dominion aid was known, it would be decided whether to complete the appeal in this country: the essential was that the buildings should go straight on to completion.

1. 40th annual report (1958-59) of the Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.

University of Leeds

Mr. C. P. Mills has been appointed clinical lecturer in otology, and Mr. Verna Wright lecturer in the department of medicine (for rheumatism research).

University of Manchester

Dr. Ralston Paterson, lecturer in clinical radiotherapy, has been granted the status of professor, with the title of professor of radiotherapeutics. He will continue to hold his appointment as director of radiotherapy at the Christie Hospital and Holt Radium Institute, Manchester.

Dr. Paterson was educated at George Heriot's School, Edinburgh, and the University of Edinburgh, where he graduated M.B. with honours in 1923. After postgraduate study at the University of Cambridge he took the D.M.R.E. in 1924. From 1926 to 1930 he held appointments in Minnesota and Chicago, and in 1930 he was appointed acting director of the radiological department in the Edinburgh Royal Infirmary. The following year he moved to Manchester to take up his present appointment at the Christie Hospital and Holt Radium Institute. He has been a part-time member of the staff of the university since 1942. In 1953 he became honorary director of the Medical Research Council's betatron research unit. He was elected a fellow of the Royal College of Surgeons of England in 1948, and he was appointed C.B.E. in 1950.

The university has instituted a chair of preventive dentistry to which the council has appointed Mr. J. L. Hardwick, M.D.S., who has held a readership in dental surgery in the University of Birmingham since 1952.

University of Sheffield

The following appointments have been made:

Dr. Margaret M. Platts, lecturer in medicine; Dr. H. A. Salmon, assistant lecturer in physiology; Dr. J. D. Howard and Dr. O. H. Simms, part-time instructors in anæsthetics.

International Symposium on Allergy

This symposium, organised by the European Academy of Allergy in collaboration with the Spanish Society of Allergy, will be held in Barcelona on June 3 and 4. Further particulars may be had from the secretary, Mr. Camps, Academia de Ciencias Medicas, Via Layetana 31, Barcelona 3, Spain.

Toxic Sprays Study Group

Dr. J. M. Barnes, Dr. Donald Hunter, and Prof. W. L. M. Perry have been appointed members of this group which has been set up by the Minister for Science, the Minister of Agriculture, Fisheries, and Food, the Secretary of State for Scotland, and the Minister of Health.

Expenditure on the National Health Service

The Civil Vote on Account for 1960–61 shows estimated net expenditure on the National Health Service as £519,172,485 in England and Wales, compared with £501,124,100 in the present financial year, and as £64,332,850 in Scotland, compared with £61,617,555 in the present year (1960–61, Vote on Account: Civil Estimates. H.M. Stationery Office. 6*d*.).

Social Security Agreements with Denmark and Finland

The reciprocal social security agreements which the United Kingdom concluded last July and August with Finland and Denmark have been ratified, and both will come into force on March 1.

The agreements cover benefits provided by the schemes of national insurance, industrial-injuries insurance, and family allowances in this country and the corresponding benefits in Denmark and Finland.

International Course on Lyophilisation

The Association des Cours Internationaux de Lyophilisation will run a second international course at Lyons from Aug. 29 to Sept. 9. Like the first international course, which was held in 1958, the meeting will be sponsored by the International Institute of Refrigeration and the International Association of the Societies of Microbiology. Teaching will be in English and French and the programme includes lectures, technical demonstrations, and discussions. Dr. A. S. Parkes will give the opening lecture. Further particulars may be had from Dr. L. R. Rey, Laboratoire de Physiologie, École Normale Supérieure, 24, rue Lhomond, Paris, 5e, France.

A New Veterinary Journal

The rapid advance of veterinary research has led the British Veterinary Association to start a new quarterly journal entitled *Research in Veterinary Science*. Contributors and subscribers, at home and overseas, are asked to note that manuscripts should be sent to the scientific editor, 7, Mansfield Street, London, W.1, and annual subscriptions (90*s*. for non-members and 60*s*. for members) to Blackwell Scientific Publications, Ltd., 24, Broad Street, Oxford.

Mr. Derek Walker-Smith, the Minister of Health, has appointed Mr. B. R. Rayner to be his assistant private secretary.

A refresher course for general practitioners will be held at Joyce Green Hospital, Dartford, Kent, at 3 P.M. on Fridays from April 22 to July 1. Further particulars may be had from Dr. J. C. Hogarth, West Hill Hospital, Dartford.

The Hospital for Sick Children, Great Ormond Street, London, W.C.1, has prepared a brochure, *Welcome to Hospital*, which it is proposed to send to parents when arrangements are being made to admit a small patient.

The Royal National Mission to Deep Sea Fishermen sends bundles of magazines aboard vessels before they leave port. These are always eagerly read on the voyage no matter what the date. A doctor has lately sent a bundle of discards from his waiting-room and the Mission wonders whether others would be willing to follow their colleague's example. Bundles should be sent direct to the Mission Institutes: R.N.M.D.S.F., Goulton Street, Hull; or R.N.M.D.S.F., 4, Charles Street, Milford Haven.

CORRIGENDUM: *Polyneuritis and Central Hypertension due to Non-parotitic Mumps.*—Dr. Pallis asks us to correct the antibody figures given in his paper of Feb. 13. They should have been:

Date (1959)	*Day of disease*	*Mumps "virus particle" antigen*	*Mumps "soluble" antigen*
Jan. 13	6	16	64
„ 23	16	64	64
Feb. 19	43	32	16
Mar. 13	65	<8	<8

Diary of the Week

FEB. 28 TO MARCH 5

Monday, 29th

UNIVERSITY COLLEGE, Gower Street, W.C.1
5 P.M. Dr. Antoinette Pirie: Biochemistry of the Eye. (First of two lectures.)
POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
4 P.M. Dr. Brian Ackner: Modern Drug Treatment of Mental Disorder.
UNIVERSITY OF ST. ANDREWS
4 P.M. (Queen's College, Dundee.) Dr. William Walker, Dr. H. B. Goodall: Hypersplenism.

Tuesday, 1st

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Pathology.* Prof. L. S. Penrose: Human Genetics and Disease. Dr. Hermann Lehmann: Familial Deficiency of Pseudo-cholinesterase. Dr. Aron Holzel: Galactosæmia—a Hereditary Disease.
8.30 P.M. *Orthopædics.* Mr. Rainsford Mowlem, Prof. C. G. Rob, Mr. R. G. Pulvertaft: Early Management of Soft Tissue Injuries of the Extremities.
BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. Alick Isaacs: Anti-viral Action of Interferon.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. C. W. F. Burnett: Aspects of Abortion.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. Isaac Muende: Diagnosis and Treatment of Fungous Infections.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, 91, Dean Street, W.1
5.30 P.M. Mr. K. I. Nissen: Mechanism and Treatment of Compression of the Median Nerve at the Wrist.
LEEDS NEUROLOGICAL SCIENCES COLLOQUIUM
5.15 P.M. (General Infirmary at Leeds.) Mr. Wylie McKissock: Surgical Versus Medical Treatment of Posterior Communicating Aneurysm.
UNIVERSITY OF ST. ANDREWS
5 P.M. (Queen's College, Dundee.) Prof. Adam Patrick: The Plague of Athens, 430 B.C.—A Problem in Diagnosis.

Wednesday, 2nd

UNIVERSITY OF LONDON
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Prof. Gerhard Schramm (Tübingen): Mutagenesis in Viruses.
ROYAL SOCIETY OF MEDICINE
5.15 P.M. *History of Medicine.* Dr. R. E. Smith: George Henry Lewes and his *Physiology of Common Life*, 1859. Mr. James Robinson: History of Gastric Surgery.
8 P.M. *Surgery.* Dr. Keith Simpson, Mr. J. P. Mitchell, Mr. B. B. Milstein, Dr. J. B. Wyman, Mr. R. H. F. Brain: Accidents in the Operating-theatre.
POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Dr. Fraser Roberts: Sex-linked Inheritance in Man.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Mr. T. E. Hughes: Mites or Acari.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Mr. W. P. Cleland: Surgical Treatment of Fallot's Tetralogy.
OXFORD UNIVERSITY
5 P.M. (Radcliffe Infirmary, Oxford.) Dr. D. Denny-Brown: Nature of Brief Recurrent Cerebrovascular Episodes. (Litchfield lecture.)
MIDLAND MEDICAL SOCIETY
8.15 P.M. (36, Harborne Road, Edgbaston.) Prof. Douglas Hubble: Growth and its Disorders.
MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. (18, Nicolson Street, Edinburgh.) Prof. Stanley Alstead: Therapeutic Miscellany.
UNIVERSITY OF ST. ANDREWS
2.30 P.M. (Queen's College, Dundee.) Dr. Walker: Current Studies in Blood Coagulation.

Thursday, 3rd

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5.30 P.M. Dr. R. M. B. MacKenna: Dermatological Aspect of Certain of the Diseases of the Mouth and Ear.
NUFFIELD ORTHOPÆDIC CENTRE, Wingfield-Morris Orthopædic Hospital, Oxford
8.30 P.M. Dr. W. H. Harris: Fibrous Dysplasia.
UNIVERSITY OF ST. ANDREWS
5 P.M. (Queen's College, Dundee.) Prof. W. D. Armstrong (Minneapolis): Studies of Fluoride Metabolism with Radiofluoride.

Friday, 4th

ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Otology.* Dr. Gunnar Lidén (Gothenburg), Mr. Kenneth McLay, Mr. Gavin Livingstone: Measurement of Deafness.
2.30 P.M. *Laryngology.* Dr. Herman Diamant (Stockholm), Sir Roy Cameron, Mr. D. H. Patey: Salivary Glands—Physiology, Pathology, and Treatment.
5.30 P.M. *Anæsthetics.* Dr. J. E. Riding: Postoperative Vomiting.
POSTGRADUATE MEDICAL SCHOOL OF LONDON
10 A.M. Sir Eric Riches: New Growths of the Kidney.
4 P.M. Dr. Roberts: Medical Genetics.
JAMES YEARSLEY LECTURE
5 P.M. (1, Wimpole Street, W.1.) Mr. Ian Thorburn: A Critical Review of Tympanoplastic Surgery.
INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.1
4.30 P.M. Dr. Macdonald Critchley: History of our Conception as to the Origin of Language in Man (II).
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Dr. D. A. Osborn: Blood Diseases in Ear, Nose, and Throat Conditions.
MIDLAND CENTRE FOR NEUROSURGERY, Holly Lane, Smethwick, 41
8 P.M. Professor Denny-Brown: The Nature of Polymyositis and Related Muscular Disease.
PLYMOUTH MEDICAL SOCIETY
8.30 P.M. (Freedom Fields.) Mr. P. D. Trevor-Roper: Influence of Eye Disease on the Artists.

Saturday, 6th

INSTITUTE OF LARYNGOLOGY AND OTOLOGY
NOON. Prof. Michel Portmann (Bordeaux): Interposition for Otosclerosis.
MIDLAND THORACIC SOCIETY
3 P.M. (36, Harborne Road, Edgbaston.) Prof. W. Melville Arnott: Management of Cardiac Failure.

Appointments

ANKLESARI, R., M.B. Bombay: anæsthetic registrar, United Norwich Hospitals.
GOLDER, RUTH Y., M.B. St. And., D.Obst., D.P.H.: senior assistant M.O., Tottenham and Hornsey, Middlesex.
JAYANANDAIAH, H. P., M.B. Mysore, D.T.M. & H.: medical registrar, Foxhall Hospital, Ipswich.
KING, P. F., F.R.C.S., D.L.O.: consultant otologist, Tewin Water Residential School for Partially Deaf, Hertfordshire.
MILLAR, G. R., M.B. Edin.: M.O., Eastern Regional Hospital Board, Scotland, for duty as deputy group administrative medical superintendent, County and City of Perth general hospitals.
YARROW, ALFRED, M.B. Edin., D.P.H.: area M.O., South-east Essex, M.O.H., Benfleet, Canvey Island, Rayleigh, and Rochford.
YULE, I. G., M.B. Manc.: assistant divisional M.O., Failsworth area, Lancashire.

Colonial Appointments:

BOYD, P. I., M.D. Lond., M.P.H.: principal M.O., Jamaica.
COLLYMORE, H. W. M., M.B. Lond., F.R.C.S.: specialist M.O., Trinidad.
COMELY, J. F., M.B. Edin.: M.O., Northern Region, Nigeria.
COOMBES, A. H. R., M.B.E., M.R.C.S., D.P.H., D.T.M. & H.: A.D.M.S., Hong Kong.
CRAIG, W. J. A., M.B. Edin.: M.O., Hong Kong.
DAVIES, C. W., M.R.C.S., D.P.H.: secretary to Ministry of Health and D.M.S., Uganda.
HARNARAYAN, PERCIVAL, M.B. Lond., F.R.C.S.: specialist M.O., Trinidad.
HARROWER, J., M.B.: M.O., Uganda.
HYSLOP, D. A., M.B. Lond.: M.O., Uganda.
LEIPER, N. K., M.B. Cantab.: M.O., Uganda.
MOORE, G. W., M.R.C.S.: senior M.O., Dominica.
NEWLAND, M. A., M.B. Cantab.: M.O., Aden.
RATULANGIE, C. J. A., M.D. Utrecht: M.O., Northern Region, Nigeria.
STEEN, T. R., M.B. Cantab., F.F.A. R.C.S., D.A.: specialist (anæsthetist), Uganda.
TENG, PIN HUI, M.B. Hong Kong., D.P.H.: D.D.M. & H.S., Hong Kong.